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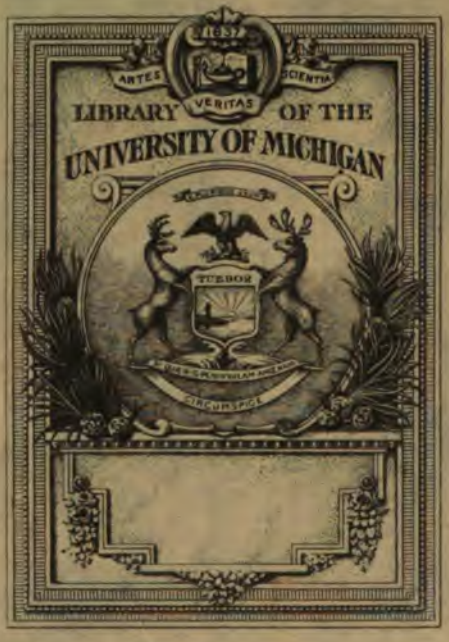
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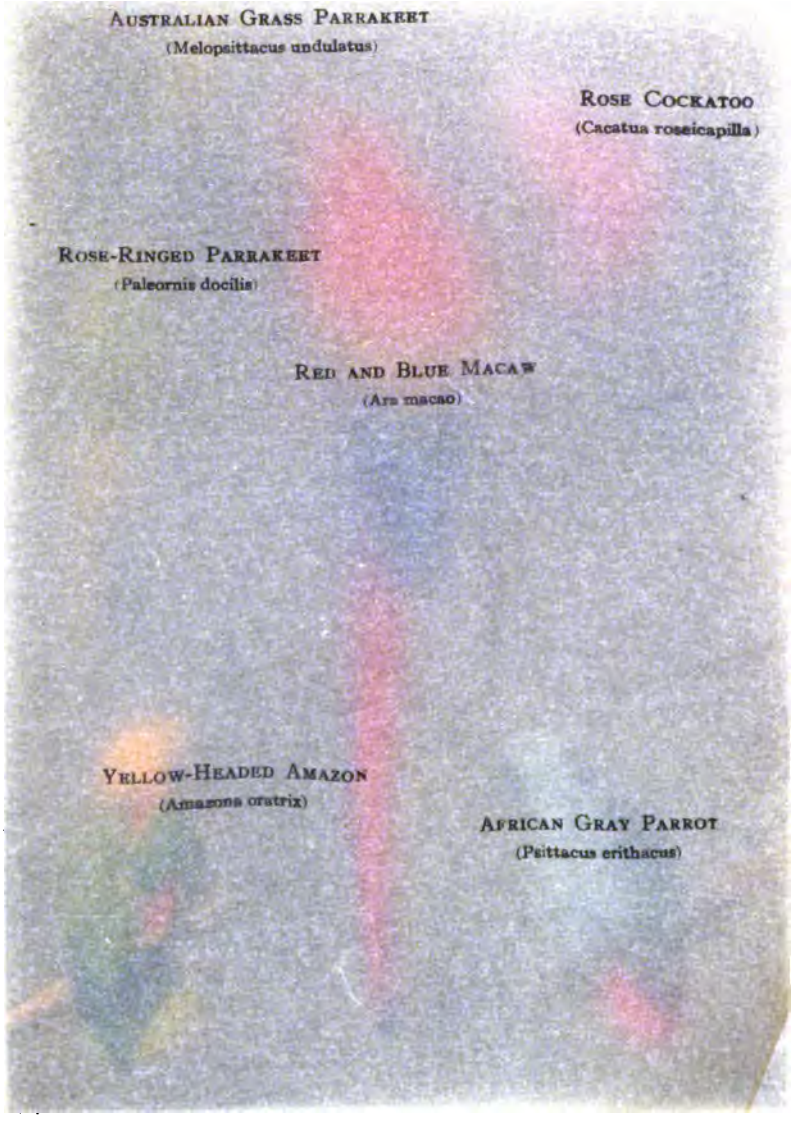
AUSTRALIAN GRASS PARRAKEET
(Melopsittacus undulatus)
ROSE COCKATOO
(Cacatua roseicapilla)
ROSE-RINGED PARRAKEET
(Palaeornis docilis)
RED AND BLUE MACAW
(Ara macao)
YELLOW-HEADED AMAZON
(Amazona oratrix)
AFRICAN GRAY PARROT
(Psittacus erithacus)

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1915

THE PET BOOK

Anna Botsford Comstock

Assistant Professor Nature-Study, Cornell University
Author Handbook of Nature-Study, Bird Note Books, How to Keep Bees

SECOND EDITION

ITHACA, NEW YORK
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1915

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GENEVA, N. Y.

To
My Special Pet and Namesake

Anna Bertha Herrick

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PREFACE

THE keeping of pets should provide the child with excellent training for making him responsible. To attain this he should have the entire care of the dependent creature. The chief advantage of this peculiar training and responsibility lies in the fact that the child loves the pet, and there is no training in thoughtfulness for others so educating as that attained through loving service.

If the child tires of a pet, it should be given to someone else, or chloroformed. It is a cruel act to make a pet dependent upon a careless or unloving master, and it teaches a child cruelty and hardness of heart to be obliged to give unloving care.

Pets are greatly needed in most homes these days, for this very purpose of developing responsibility in children, by giving them duties of real importance. In our present civilization there seems little enough to give a child the training that was so valuable to us who were fortunate enough to spend our childhood upon the farm, where a thousand little duties were constantly calling to us, and which, very early, impressed upon us the fact that this world did not exist for our selfish pleasure, but rather as an opportunity for us to exercise the helping hand; and that our importance in it was measured by our usefulness.

The keeping of pets should also be an education to a child in the matter of interesting him in other countries, through a study of his pets in their natural surroundings. Thus he should be spurred on to the study of natural history, and come to feel that

his interests are world-wide. The parrot should make him anxious to read of Africa and Australia or Brazil. The Guinea-pig, of Peru; and the love-birds of Madagascar.

In this book a brief outline is given, first, of the creature, or its ancestors, in native surroundings, and how life is carried on there. This is for the purpose of making the child more intelligent in his treatment of the pet.

It has not been within the scope of so small a book to discuss extensively breeds and varieties. If a child is to make a specialty of dogs, cats, guinea-pigs, or canaries, or any other creatures, he should have the books devoted to this one subject. A carefully selected bibliography is added to each subject, that gives the names of special books dealing with these animals. Nor is it within the scope of this book to deal, except in the most casual way, with the diseases of animals. Plenty of suggestions for hygiene are given in each case, and if the pet falls sick, a physician or a veterinarian should be consulted.

The mocking bird is not included because of the recent law, which prohibits the use of this bird as a caged pet. Undoubtedly there are many creatures used as pets which are not mentioned, since only the more common ones could be treated in so small a volume.

The special value of this volume, in the opinion of the author, is the help it gives in telling children how to take care of the little wild creatures they bring home as treasures captured during their woodland walks and which usually die because of ignorance of their needs on the part of their captors. This was the most difficult part of the book to write

for there is nowhere on record rational treatment for this kind of pets. Because of this, the author called upon Dr. Hornaday for help and through his kindness, she was able to interview the very efficient and experienced curators of the different departments of the New York Zoological Gardens and take extended notes on food and care of these most common animals.

There has been an insistent call for this kind of information from teachers of Nature-Study and Biology and also from the Boy Scouts who make their camps more interesting by capturing various wild creatures as they find them.

"Being a 'Pet' is at best a hazardous occupation."

W. T. HORNADAY.

ACKNOWLEDGMENTS

The author owes grateful acknowledgments to Dr. W. T. Hornaday, and his courteous assistants, whose advice as to the care of birds and animals has rendered this volume far more practical than it could otherwise have been. She also wishes to make acknowledgments for the efficient help of Miss Katharine Straith and Miss Myrtle Boice in bringing together material for this book; and to Mrs. Austin Wadsworth for criticism of chapters on dogs and horses.

The author also wishes to express her thanks to Doubleday Page & Co. for their kindness in loaning many photographs used in this book, and to Professor Ida Reveley, to Miss Evelyn G. Mitchell, to Messrs. Karl and Frank Schmidt for the use of their stories, and to Miss Alice Willis and Mr. Eugene Barker for the use of photographs.

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FOREWORD TO CHILDREN

ONE of the greatest pleasures in keeping pets comes from giving them personal care. There is hardly any creature so dull that it does not learn to recognize the one who feeds and cares for it, and therefore comes to love this giver of all its comforts and necessities.

You must realize that, in a way, you stand in the same relation to your pets as do your parents or guardians to you; and you can, perhaps, imagine how you would feel if your mother were too busy some morning to give you any breakfast, or your father too absorbed in his own affairs to furnish you with clothing or care.

Your pets are helpless little creatures, absolutely dependent upon you; and any boy or girl who is a traitor to this trust, should receive like treatment from those upon whom he is dependent, so that he may learn how it feels to be neglected. If you forget to feed your caged pet some day, then you too should go without eating for a day, and discover what the experience is like. Feeding your pets should be just as much a part of your morning's routine as eating your own breakfast.

You must remember that only a few pets like to be handled. The cat, dog, and some other domestic animals are accustomed to it; but to most creatures this experience seems dangerous, and they instinctively shrink from it. Thus, consideration for your pet will keep you from trying to handle it until it has gained so much confidence in you that it invites your caresses.

Another important thing for you to bear in mind is that our common wild animals and birds, caught when young and reared in a cage, are quite unfitted to care for themselves when they are liberated. It is therefore far better to let the little creatures have their liberty as soon as they are old enough to move about freely, and keep their companionship by feeding them daily.

Gentleness and kindness are the two means at your command for gaining the love and confidence of your pets; and there is no happiness quite so heart-satisfying, as that which comes from feeling that some little dependent creature looks up to you with faith that you are the most beneficent being in the whole world.

One delightful entertainment in connection with pets is the keeping of a note-book in which is recorded accounts of their cunning actions and clever tricks. Such a note-book will ever afterwards be a source of pleasure and interest, and many of the observations recounted in it may prove of real importance scientifically. Such a book may be illustrated also if you are clever with your pencil or brush. On page 80 is given extracts from one of my own note-books devoted to a baby-squirrel. This will suggest some idea as to methods of recording animal behavior.

Study your pets as individuals, for you will find that the lower animals differ one from another as much as do people. Find by experiment what your individual pet likes best, and gratify its tastes. If possible, give a variety of food by changing the dietary somewhat from day to day; keep the cages clean and wholesome, and always provide plenty of fresh water. Do by your pets as you yourself would be done by, for the Golden Rule works quite as well with the lower creatures as with people.

Photo by Verne Morton

INTIMATE FRIENDS

A Collie and his master

Photo by Verne Morton

SPEAK FOR IT

Mammals

THE DOG

TO REALLY understand our dog we should know some of the reasons for his habits and peculiar powers. The only way to learn these is to study the ways of his nearest wild relatives, which are the wolves, for we are certain that our dogs had wolf-like ancestors. Even now there are packs of wild dogs in Australia and India that have wolf-like habits. There is perhaps no more delightful way to become acquainted with wolf habits than to read the First Jungle Book and become familiar with the ways of Mowgli's brothers. Although the Jungle Stories are in part fanciful, the habits and ways of wolves are well portrayed in them. We should also read Thompson-Seton's "Lobo" in Wild Animals I Have Known, and "Tito" in Lives of the Hunted.

Let us consider for a moment what we find in our dog that he has inherited from his wild ancestors: The ancestral dog ran down his prey, and did not lie in ambush, as did the ancestral cat. To run down such creatures as deer, sheep, goats, and the like, the dog needed to have long and strong legs, and feet well-padded, so they should not be torn by rocks; the toe-nails had to be large and stout, and not to be pulled back, like the cat's, for the dog needs his claws to help keep his footing, especially when turning quickly. The dog's body is naturally long, lean and muscular, just the kind of a body

that a runner needs; and it is covered with coarse protective hair, instead of fine fur, which would be too warm a coat for so active an animal.

The dog has a keen eye, but cannot see in the dark as well as does the cat. Yet the wild ancestors of the dog hunted mostly at night, their wonderful powers of smell rendering the keener sight unnecessary. Our dog is so much superior to us in the ability to smell, that we cannot easily imagine how the world seems to him; his world is as full of scents as ours is full of objects which we see. The damp, soft skin that covers his nose is moist, and is in the best possible condition to carry the scent to the wide nostrils. The nostrils are situated in the most forward part of the face, and thus may be turned in any direction to receive the impressions which every breath of air brings to them. Hounds often follow the track of a fox several hours after it was made. The dog knows all his friends and enemies by their odor more surely than by their appearance.

The dog's hearing is also very acute, and his ear-flaps are arranged so that they may be lifted in any direction, to guide the sound to the inner ear. His weapons for battle are his teeth, especially the great tushes, or canines; his molars are especially fitted for cutting meat, but not for chewing; these teeth cut the food into pieces small enough so that he can gulp them down, and the stomach does the rest.

Most dogs bay when following their prey, which at first thought might seem bad policy, since the sound tells the victim where the enemy is; but we must remember that wolves hunt in packs, and the baying keeps the pack together. Dogs often howl

at night; this is an ancestral habit to call the pack together; it is interesting to note that the dog when howling lifts his nose in the air so as to send the sound far and wide. The reason that occasionally a dog howls when he hears music, is because it probably reminds him in some way of the howling of the pack, and he at once joins the chorus.

Although we know that our dog descended from a wild animal, we do not know just which ones of the wolf tribe were his ancestors, for the dog was man's domesticated companion long before there were any picture records of man's history. It is believed that the savages of different lands developed their dogs from the native wild species of wolves or dogs in order to use them to help in hunting. The scientists who study the specimens of animals preserved in the rocks, tell us that the dog's brain has increased in quality and size through his association with man.

More than two hundred breeds of dogs have been developed by man, and each one has its own peculiarities, and therefore should have special treatment. All that we can do in this little book is to give general directions which are equally good for all dogs.

DIFFERENT BREEDS OF DOGS

Although different species of wild dogs or wolves may have been responsible for some breeds of dogs, like those used by the Eskimo, and although Egyptian pictures made more than five thousand years ago show that even then various breeds had been developed, yet most of our common breeds have been developed in Europe and England within a few

centuries. It is interesting to note that pictures painted by great artists showing dogs in hunting scenes, have helped much in revealing the history of different varieties.

Since dogs were tamed first to become the companions and protectors of man, so the different breeds have been developed to meet the needs or fancies of man. For instance, the bulldog was originally a large dog used for general purposes, but the need for a dog by butchers and others to subdue wild and fierce bulls developed a dog with strong jaw and grit to match. At first the bull was led by the ear, and naturally a large rather tall dog was needed for that; later, the bull was led by the nose and a smaller, short-legged dog was needed for that, and thus the bulldog as we know him was evolved.

In ancient times there were many robbers that preyed upon people who lived in isolated houses, and strong, fierce watch dogs were almost a necessity; these were called "bandogs", and from them was developed the mastiff. The great Dane came from a race of dogs prized by the Greeks and Romans in hunting fierce wild game, like the wild boar. The greyhound gained his slender body and long legs because man needed a swift dog to help him catch, for food, swift animals like rabbits and deer. Later the foxhound was developed to hunt foxes for sport; and the long-bodied short-legged dachshund was evolved to go into the burrows of badgers and rabbits and thus capture these creatures. The great St. Bernard came into being by aiding the monks of Switzerland in keeping to the safe roads in deep snows, thus enabling travelers to reach the hospices in safety. The Newfoundland probably developed itself as a water dog since in that country

Photo by W. Reid

PUPPIES SEEING THE WORLD

Courtesy of Doubleday, Page & Co.

NOT YET FRIENDS

Courtesy of Doubleday, Page & Co.

A PRIZE DOG AND HIS MASTER

it had to eat fish or starve and therefore learned to catch fish for itself. It thus gained its webbed feet.

The spaniel was first used to start game birds for falcons both on land and water, as records five hundred years ago show; and the setter was also early developed as a dog that would sit down as soon as it located game, but pointers were probably developed independently. The spaniel, as its name indicates came originally from Spain. It was first used to spring feathered game for the hawk; while the sitting spaniel or "setter" was used to start birds to be caught in a net; and the pointer was used to point game which the hunter shot with the cross-bow,—all before gunpowder was invented.

From ancient times almost every country had its sheep dogs, for one of the earliest needs for a dog was to aid nomadic man in guarding his flocks of cattle, sheep and goats. In the British Isles there have been developed three kinds of sheep dogs, the smooth coated, the bobtailed, and the collie. The collie was developed in the Highlands of Scotland, but from what ancestors we do not know; he is famed for his loyalty and sagacity in caring for sheep, but he was scarcely known outside of Scotland before 1860. Now he is a favorite in every civilized country, and is highly appreciated for his intelligence and beauty. Every one interested in collies should read "Bob, Son of Battle," for this book gives a true picture of the skill of these wonderful dogs in their native Highlands.

The terriers seem to have originated in England and are of hound origin,—probably a mixture of foxhound or wolfhound and deerhound. They were probably mongrels of small size in that they were used to hunt badgers, foxes and rabbits in their bur-

rows. They thus won their name, terrier, from the Latin *terra*, meaning earth. Although such dogs may have existed in England for several centuries, the many breeds of terriers known today have been developed mostly within the last century.

The toy dogs were especially developed as pets, and have no use whatever. The Pomeranian or spitz is descended from a large dog, and was developed in Southern Europe. The poodle has a spaniel origin, and the fashion of clipping his hair is at least three hundred years old, as is shown by pictures. The Maltese toy dog is descended from poodles. The pug is from China, and of very ancient lineage. The Pekinese and Japanese spaniels are also of a very ancient breed, and probably have common ancestors.

HOUSE

Our friend, the dog, is so sensitive to treatment that he needs to be considered as one of the family, if we wish him to be comfortable, happy and healthy; and when he has the run of the premises with his bed in the stable he is usually very comfortable. However, it is often necessary that he sleep in a kennel, and this should always be attractive, light, well-ventilated, not too cold, well-drained, clean, and entirely free from dampness and draughts. The best kennel is one which can be cleaned and aired when not in use. It may be a wooden box, or a barrel, turned upside down, placed on a platform raised a little above the earth; or it may be an especially built house; but of whatever form, it needs to be roomy, protected from the cold winter winds and shaded from the summer's sun. It is highly desirable that there should be two little windows at the top of the

kennel, on opposite sides. These may be of glass, or simply holes with wooden shutters; in either case, they should be arranged so that they may be opened or closed, depending upon the weather or the direction of the wind.

For the dog's bed, a layer of clean straw is best, and this should be changed every week. Sawdust, carpets and mattings are not desirable as bedding, since they harbor fleas. When the kennel is scrubbed, disinfectants should be used, and it should be perfectly dry before new straw for the bed is put in place. The walls of the kennels should be whitewashed, or painted with creolin to keep them sweet and clean. There should be sand in front of the kennel, and if the dog is chained, a long chain from six to nine feet should be used, and there should be always a plentiful supply of fresh, clean water within reach. It is best to have but one dog in a small kennel.

If the dog sleeps in a warm corner of shed or stable, or if allowed to sleep in the house, he should always have a corner of his own; in such a situation a piece of carpet may be used for bedding, which should be often cleaned, or changed. Delicate dogs need a bed almost as soft as our own; but a dog should not be allowed to sleep on the bed of his master, for hygienic reasons.

FOOD

To keep a dog happy, healthy and active, we must be careful to feed him regularly and moderately; we must study our dog, and see how much he naturally eats and never urge him to eat more. Most dogs are fed too often, although there is a difference in food requirements of different breeds. Large, and very

active dogs will consume more then those which are smaller or more quiet in their habits. Two meals per day, a light breakfast and a supper which he can digest, are all that a dog needs. The best diet is varied. Meat should not be given except in small quantities; it should be cooked, and even then, should be given sparingly. The food does not need to be warm, and must never be hot or sloppy. Scraps from the table may be fed, if they contain a sufficient amount of meat; if not, cheap meat should be bought and boiled, and it, or its liquor mixed with bread or vegetables. The best diet is made of meat thus cooked, chopped and mixed with rice or oatmeal, or occasionally with corn meal for a variety; but the latter is too heating for summer diet. Rice cooked with codfish is an excellent food for winter. Cooked vegetables should be fed at least twice a week; if the dog seems hungry after eating porridge or vegetables, he may be given a dog biscuit. For breakfast give porridge with milk, taking care to not have it sloppy, and a dog biscuit three or four times a week if necessary. For the evening meal, give a mixture of vegetables and cooked meat, in the proportion of one-fourth or less of meat to three-fourths of bread or vegetables. A large dog, weighing eighty pounds, may be given at each meal three-fourths of a pound of cooked rice with one-fourth pound of cooked meat chopped, and mixed so thoroughly that the meat cannot be separated from the rice. We have known of hounds kept in perfect condition in winter when fed steadily on corn meal in the form of johnny-cake or mush mixed with stewed scraps of waste meat. The johnny-cake was made with lard or cottolene. In summer, less meat and much skimmed milk were given.

Do not pay attention when your dog begs for food, since to yield would most likely ruin his health. He should not be fed at the table, nor out of regular hours. The dishes from which he eats should be cleaned every day. They should be of earthen or agate ware, and not old rusty tins. The dishes should never be washed with the dishes from our table; this is a practice dangerous to our health. The dog is fond of gnawing bones; this assists in keeping his teeth clean. The bone should be of medium hardness, but the bones of chicken or game should never be given, as they are likely to splinter and choke the animal.

Our skin is filled with pores through which we perspire, but the dog can only perspire through his tongue. If he cannot get water on a hot day his suffering is intense; and to keep a dog well, he must always have access to plenty of fresh, clean water. A drinking dish for his use should always be kept in a certain place; there should be one inside the house, and one in the yard, and both should be cleaned and filled every day.

CARE

An over-fed, inactive dog is a loafer, and not to be desired. The best dog is one that takes plenty of exercise. If possible, he should be allowed to run daily in the fields; but if this is not practicable, he should be taken out daily for long walks.

The dog's skin is very sensitive, and he should not be washed except when necessary. In summer he may be bathed often, but in winter only when decency demands it. He should be bathed in water of tepid temperature. The head should be wet first, but the water should be kept out of the ears, since

it causes canker. After coming from the bath he should be placed where there are no drafts, and where he will dry rapidly and thoroughly. Kneading him, and rubbing with a coarse, rough towel, will assist in this process. After the bath he should be taken for a brisk run.

A desirable collar for a dog is of flat leather; but a round leather collar is cooler for summer.

If it is necessary to chain the dog, fasten a wire rope between two trees or posts, about seven feet from the ground, place a ring on the rope to which attach his chain, this will give him some freedom for exercise.

The dog always recognizes a friend. He is very sensitive, and harsh treatment will never teach him obedience. He is intelligent, and with patience may be controlled by the tone of voice. When he does wrong, he should be corrected at the time, but he should never be struck over the ears, mouth or abdomen. An obedient dog is far happier than one that disobeys. Develop his intelligence, and teach him to do useful things, as well as to play.

If it is desirable that the dog should look his best, he may be brushed with a leather brush once a week; the brush and comb should be disinfected and cleaned after use each time. Ordinarily combing and brushing is reserved for show dogs. The disinfectant used for kennels and cages in the New York Zoological Gardens is "White pine," diluted according to directions, and sprinkled or spread over the walls and floors. Jeyes fluid, sanitas and izal, in hot solutions may be used. Creolin is also excellent. The kennel must be sprayed while it is empty, and the disinfectant must be washed off before the animal is returned to it. If this is done often, the dog will be kept free from fleas and other parasites.

Photo by Verne Morton

TRAINING THE PUPPY

Photo by Verne Morton

A LITTLE ROUGH RIDER

If the dog is in poor condition, and becomes thin and weak with distended stomach, and has a large appetite, he is probably afflicted with worms, and should be given a good vermifuge when his stomach is empty. "Sure-shot" is very highly recommended as a vermifuge, and should be used according to directions; however, there are many good medicines of this sort on the market, and usually after a vermifuge is given it should be followed with a dose of castor oil, a teaspoonful for a small dog, or a tablespoonful for a large dog. The rubbing of the hind parts along the ground is a sign that a dog is troubled with worms.

For constipation, olive oil may be given, or small doses of castor oil. A little cod liver oil should be given occasionally to keep the dog in good condition. This may be procured in form of biscuit.

Food manufacturers like Spratt's Co. have a large variety of foods which have corrective and tonic effects upon the dog's system, and may be substituted for medicine.

For wounds and sores apply flowers of sulphur and crude petroleum mixed to a thick cream.

CARE OF PUPPIES

The mother dog should have all the freedom possible before giving birth to her puppies. She should also have an extra amount of food. It is far better to let her have freedom and choose her own place to cradle her young; or if this is impossible, a comfortable, well-drained kennel, quiet, retired from people and dogs should be provided for her. The puppies are carried by the mother nine weeks, and are born blind. Their eyes open in eight to ten days. The mother should be left alone in their earliest care.

While she is nursing her litter she should be given plenty of easily digested food, which should be salted, and have in it plenty of oily matter. She should not be allowed to bring up too large a litter, never more than eight, and fewer according to her size. If the puppies are thin, one or more should be taken away.

As soon as the puppies are old enough to take food from us, they should be fed four times a day, and milk should be a large part of the food. If vegetables or mush are given with it, there should be twice as much of milk. As it is desirable that puppies should eat all that is possible, they may be fed more than they can eat, but the remains must be cleaned up each time. A dry dog biscuit should be given the puppy to gnaw when he is about eight weeks old, so that the teeth may be strengthened and kept clean, but he should never be given a hard bone. Phosphated lime or bone-dust should be scattered over the puppy's food from time to time to help in forming his bones. Puppies should never be lifted by the neck as we lift a kitten, but should be lifted by placing both hands beneath the body.

If puppies are afflicted with fleas they should be washed carefully and dried in a warm atmosphere, and their kennels disinfected. Many recommend Deoter's cream of parasites, which may be used with safety with excellent results in freeing dogs from fleas; or they may be washed with Spratt's or Jeyes' soaps, and izal used afterwards.

Puppies are likely to be troubled with lice which do not affect the old dog. If a mixture of lard and flowers of sulphur be rubbed over the puppy, especially at the roots of the tail, and around the backs of the ears, this pest may be conquered. When applying the paste rub against the hair. The paste may

be applied twice, leaving one day between. The day after the last application the little victim should be washed with soap and water and dried carefully, in a place free from cold and drafts. This remedy rarely needs to be used a second time.

Puppies are likely to be troubled with worms after weaning. The signs are, inflated abdomen, weakness as shown by sitting or lying instead of running about, and becoming so thin that the ribs show. A vermifuge once or twice repeated is important. Get a good vermifuge, like "Sure-shot," or Spratt's worm capsules for puppies, and follow directions.

Each puppy individually must be taught cleanly habits, beginning as soon as it is old enough to run about freely. At this time the puppy requires constant care, and only by unwearying attention can it be properly trained. It should be put out of doors every half hour for the first three days after it has been brought into the house. Each time, as it comes back, it should be patted and praised. If it urinates on the floor, rub its nose in the puddle and put it out of doors, but do not whip it, since a nervous dog will thus be cowed and be all the harder to train. After the three days, watch carefully and if it begins to seem uneasy and to sniff around the floor, take it up and put it out immediately. If the puppy is to live entirely in the house, a sand tray should be provided, which should be placed in a closed box, and the puppy should be put into this box instead of out of doors. The sand in the tray needs to be changed every day. Two weeks of careful training usually serves to teach most dogs cleanly habits. Care must be taken never to keep the dog waiting if it seems uneasy, and it should be borne in mind that an ill-trained dog owes his failings to the fault of the trainer.

DOG MAXIMS

Never give a dog hot food.

Never allow a dog to eat out of a dish used by people for eating or washing; the dog has parasites dangerous to us.

Never let a dog lick your face.

Do not force a dog into water for sticks if he does not wish to go, for it may injure him.

If the dog leaves part of his food untouched, he is being fed too much.

If a dog bites you, disinfect the wound with a strong solution of carbolic acid and consult a doctor.

If you do not wish your dog to be "smelly", wash him as often as needful, and wet him to the skin.

If you have to punish your dog, do it when he is caught in the offense, for dogs cannot remember long.

Never strike a dog over the head, ears, or abdomen.

The dog should always have access to fresh, clean water.

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Courtesy of Doubleday, Page & Co.

GIVING THE PUP A RIDE

Photo by Verne Morton

YOUNG FOXES

THE FOX

DARING and rascally is the fox as a pet, and on account of its rascality it needs especial attention and care. Many a country boy who kept his pet fox carefully chained to a kennel wondered how it managed to capture a chicken so often. But, after he had studied the wiles of his pet, he wondered no longer; for he saw it apparently deliberately bait the chickens with the remnants of its meal, meanwhile pretending to be fast asleep, until some reckless biddy came within the radius of its chain.

The fox lives in a den or burrow, often selecting a woodchuck burrow, or making one for itself. I once saw a fox home that was in a rather deep cave beneath the roots of a stump. The mother fox usually selects some open place for a den for her litter; often an open field or side hill is chosen for this. The den is carpeted with grass, and is a very comfortable place for the fox cubs. The den of the father fox is usually near by.

The fox is an industrious hunter of meadow mice, rabbits, woodchucks, frogs, snakes, grasshoppers and birds and their eggs. It has a bad reputation with the farmer because of its attacks on poultry. It not only raids hen-roosts, but catches many fowls that are wandering through the fields after food. It carries a heavy bird, like a goose, in an interesting manner, by slinging it over its shoulder, and holding the head in its mouth to steady the burden.

Young foxes are born in the spring. They are black at first and are exceedingly playful and active. Their parents give them most devoted care.

HOUSE

Since the fox is closely related to the dog, it should be treated much like a small dog. The pet fox should be chained to a comfortable kennel, or its kennel may be kept in a yard enclosed by a wire fence, which needs to be about six feet high, and should be turned inwards at the top for about a foot, otherwise the captive will climb out. The kennel needs to have fresh bedding put in at least every week, for the fox has a strong and disagreeable odor, and its home soon becomes a most offensive place. If kept in the yard the ground must be kept clean.

FOOD

A young cub may be brought up on a bottle, giving it warmed cow's milk. As soon as old enough to eat, it may be fed on dog biscuits soaked in milk, and chopped raw meat. The full-grown fox will eat soaked dog biscuit, scraps from the table, and is particularly fond of fowls' heads; and in fact will take almost any kind of raw meat. Fruit or carrots should be offered. These may not be eaten, but the fox should have some vegetable food, and sometimes seems to have a liking for it. Plenty of cold water should be kept where the pet can have access to it at all times.

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From Handbook of Nature-Study

RED FOX

Photo by Alice Willis

KITTY LIKES MILK

THE CAT

ONLY the student of history can fully appreciate the importance of cats. If we could know really the history of the civilizations of the world, we should undoubtedly find that cats have played an important part in it. Wherever pioneers have planted their crops, there have followed rats and mice in plenty to reap their harvest; therefore, no part of their household belongings was prized more by our forefathers than the domestic cat. Indeed, the cat is still a great factor in keeping in check rats and mice. Our government appropriates money every year to support cats in the postoffices and other public buildings; and now in Pittsburg our national government is attempting to develop a strain of cats that can endure life in cold storage warehouses. Thus we can see that the story of Dick Whittington reveals to us, better than most written histories, the value of a cat in a country overrun with vermin. In Dick Whittington's time a cat was indeed worth its weight in gold.

There are in general, two kinds of cats,—the long-haired or Persians and the short-haired which includes our common household puss.

Formerly the Angoras were supposed to be distinct from the Persians, but now they are regarded as indistinguishable. The Persian varieties are determined by color. They are the Blacks, the Blues,

the Brown Tabbies, the Oranges and Creams, the Silvers, the Tortoise-shells, and the Whites.

The short-haired cats show many varieties in the matter of color, and some in form. They are the Blacks, the Russian Blues, which are not tinged with slate, but are intensely blue, the Creams, and Oranges, the Dutch-marked, being white with black or blue or cream or orange, the Tabbies, the Tortoise-shells and the Whites. The Siamese is pure cream or fawn with seal-brown face, ears, legs and tail, and has bright blue eyes. Manx and Japanese cats have no tails.

In an ancient Egyptian picture, a cat with a black stripe on the heels is represented as catching birds for its master. At Sakkara and Benihassan in Egypt are cemeteries of cat mummies, which show how much these creatures were prized thousands of years before the Christian Era.

Thus puss has been made the companion of man for so many centuries that we do not know what she was like in her original wild condition. Possibly she, like the dog, has several species, in different countries, as ancestors. However, there are plenty of wild cats still living in many parts of the world, and we can judge by studying them what the wild habits of our domestic pets naturally were.

The cat can run rapidly for a short distance, but she is not a natural runner like the dog; instead, she is fitted with strong hind legs which enable her to leap far. She does not get her prey by chasing it; she lies in ambush behind some object, or stretched along a limb, not too high from the ground, and there waits for some unsuspecting creature to pass; then she gathers herself tensely and leaps upon her victim stunning it with the blow, and seizes it in her sharp curved claws, and her sharp tushes.

The long, strong, supple body of a cat, covered with soft, sleek fur, is graceful and sinuous in its motions; her step is stealthy, for her claws are retracted above her toe-pads, and make no noise; when hunting she assumes a slinking gait; her eyes are fitted for seeing in daylight or in semi-darkness; the pupils are contracted to mere vertical slits during the day, but at night they expand over almost the entire eye. At the back of the eye is a reflecting surface which catches such dim light as there is, and by reflecting it, enables the cat to use it twice. The cat's nose is moist, and her sense of smell is excellent, but not so keen as that of the dog. However, she has a very keen sense of hearing. Her whiskers are of great use to her; these long hairs about the face are connected at their roots with sensory nerves, so that when moving in the dark, if one of them touches an object, pussy at once receives warning.

Puss has a wide range of expression in her voice and gestures. She can mew questioningly, cozily, affectionately or entreatingly; she can squall when hurt, and emit heart-rending mews when she is lonely, and growl when you interfere with her food. She can purr, which is a very soothing noise indeed; but when she sings for the entertainment of her lover, or howls defiance at her enemy, she wails in a manner that sends chills down the spine of the listener. She can also "spit," a performance most expressive of defiance or contempt. When angry, she switches her tail threateningly; when feeling pleasant and companionable she carries her tail upright; and when frightened, the hairs of the tail stand out, making it three times its natural size.

The cat is a night-prowler by nature, for it is then she most easily finds her prey. She is especially a

hunter of mice and rats, which are also night-prowlers; although these creatures form a natural part of her food, yet she gets so many internal parasites from them, that sometimes her health is thus greatly injured. "Mice make a cat poor," say the farmer people, a true observation because of the many worms which have their early stages in mice, and their later stages in the intestines of the cat.

Cats should, when young, be taught to leave birds alone. A little attention in training the kitten will later save the life of many a bird. As soon as the kitten is old enough to begin to notice birds, it should be switched every time it even looks at one. A few days of this kind of treatment is usually sufficient to teach the lesson, for the kitten is no fool. If she persists in catching birds, take the bird from her that she has just killed, put some red pepper upon it, and let her have it again. If this is done once, it will usually make her afraid to touch any bird thereafter.

Leaving cats at summer cottages during the winter ought to be considered a criminal offense. The poor cats suffer from the unaccustomed rigors of winter, and by starvation they are forced to climb trees in search of birds. Many thousands of our beneficial song birds are thus sacrificed every year because of the wicked thoughtlessness of people who desert their cats and thus render them wild in their habits.

An intelligent cat may be taught many things, and each of us who loves our puss may have an interesting story to tell of the achievements of our especial pet. When I was a baby of five months, I was adopted by a cat, a handsome black and white creature called "Jenny." A cruel woods-cat had come to the barn and killed Jenny's first litter of kittens, and she was a lonely and disconsolate little mother, mourning for

her children. She seemed to comprehend that I, although larger than she, was an infant. She tried to give me milk from her own breasts, and later brought me half-killed mice and placed them enticingly near my hands in my cradle when I was put to sleep on the piazza. Whenever I cried she came to me and tried to comfort me, during the first nine years of my life, which was as long as she lived. Even now I can remember how great a comfort she was to me when naughtiness was the cause of my weeping, and when therefore I felt that the whole world except Jenny was against me. Jenny opened all of the doors in the old farm house from the thumb-piece side. She leaped up and thrust one front leg through the handle, thus supporting her weight while she pressed down on the thumb-piece with the other front foot. I remember our guests were greatly astonished at seeing her come thus swinging into the room on the door. Jenny was very polite, and always thanked us with a mew when we opened the door to let her in or out.

HOME

The cat is very sensitive to treatment, and responds to good care; if we wish a cat as a real pet we must provide it the comforts of a home. A special sleeping place should be given; this may consist of a box or a basket, in which should be placed a bed of soft straw or hay, with disinfected sawdust sprinkled on the bottom of the box; this bed should be changed as often as is needed. A bit of carpet or a cushion may be used for bedding, but this needs to be frequently cleaned, or it may become infested with fleas. The bed should be placed in a warm and protected situation; cats should not be put out of doors

nights. In case the cat is valuable, the risk of losing it is great if it is allowed to run out at night. Moreover, it does greatest damage to birds at night, or during early morning.

If puss is confined in the house, a shallow tin or box of dry earth or ashes should be kept in some convenient place, and she should be taught to use it. This should be emptied every day to keep it perfectly sanitary.

If a number of cats are kept there should be a special room or building with an outside run for their use. This place would need to be heated in cold weather, and must be free from damp, frost and draughts. Cats do not do well in pens or cages.

FOOD

Cats should be fed well at regular periods. Bread and milk is an acceptable food to most. Potatoes mixed with meat scraps and gravy may be given now and then; occasionally fish heads, or other fish scraps, boiled with or without rice, are greatly relished. Many cats like porridge in the winter months, and all enjoy getting raw meat off of bones; however, smaller bones of chicken or game should not be given lest they cause internal injury. Cooked meat, in reasonable quantities, should be given each day. Cats are fond of grass, mint and catnip; catnip especially should be harvested in the summer, so that it may be given in the winter. Some advise the feeding of a little raw meat three times a week, but this sometimes produces indigestion, or what is often called "fits." Above all, a dish of clean water should be kept where puss can help herself, for she likes to drink many times a day. Feeding her milk is not

compensation for lack of water, therefore her special drinking dish should be kept filled with clean water, where she can reach it at any time.

CARE

Cats are sensitive and nervous creatures, and therefore it is necessary to treat them with gentleness and kindness. They are timid, but are fond of notice. They are very sensitive to the tone of voice, and often a stern command serves quite as well to warn or punish as a whipping. They are greatly benefited by warmth and sunshine, and should have plenty of exercise. Bathing is not necessary for the short-haired cats, for they are very cleanly and attend to their own washing. The long-haired cats need more care, and cannot be allowed their liberty. They need to be carefully washed, dried and combed before a fire, often enough to keep them clean. Some advise the cleaning of the fur with fine flour, which can be rubbed in and brushed out. During the summer months cats are often troubled with fleas. One remedy for this is to wet the fur in a solution consisting of one quart of water to two tablespoons of creolin. This kills the fleas, and leaves no unpleasant odor, and is not poisonous to the cat. A lather of tar soap also may be used for this. An old fashioned remedy was to spray the cat's fur and bedding with spirits of camphor. Carbolic acid should never be used as a disinfectant around cats as it does not agree with them.

The epileptic "fits" with which cats are afflicted are often caused by internal parasites, and some good vermifuge should be given. One grain of santonine sprinkled into a little milk and fed three times in one

day on an empty stomach will usually effect a cure; this treatment may be repeated twice at intervals of two days to make sure. As santonine is a poison if given in large quantities, it should be followed with a teaspoonful of castor oil at night. Cats are often afflicted with diarrhœa, and the cure for this is to keep the patient confined, and give only a very small amount of food, which should consist of boiled rice and a little boiled milk. For constipation give a teaspoonful of castor oil; one authority advises Garfield tea steeped strong and given in teaspoon doses.

Puss has a strong love for places and does not take readily to a new home. Therefore, if it is necessary to move a pet cat, she should be taken into a room of the new house, close the doors and windows, and pet her and talk to her so that she feels that she is not alone. Then she should be allowed to examine the room until she becomes acquainted with it; and her nest should be placed in the corner. Later she should be allowed to examine the entire house at her leisure, and usually after a little she will settle down into her new quarters contentedly.

Every cat allowed in the house must be broken to cleanliness when young. This is best done by giving kittens close attention, and putting them out of doors, or in their box with the sand tray as soon as they are seen to be sniffing around corners of the room. If the worst happens, the kitten's nose should be rubbed in the urine or excrement and then it should be put out of doors. To a cat, which has a most sensitive nose, there could be no greater punishment or indignity than this. With care in putting the kitten out of doors at intervals, usually one or two repetitions of this punishment is enough. A kitten has a far better memory than has a puppy.

From Country Life in America

READY FOR THE KITTEN SHOW

Courtesy of Doubleday, Page & Co.

IN MISCHIEF

Photo by Verne Morton

AN UNUSUAL STEP-MOTHER

CARE OF MOTHER AND KITTENS

When the young are expected the mother should have a dark and quiet retreat. She should be given an open basket with a soft carpet in the bottom, and she should be supplied with all the milk she can drink

There are usually from two to five kittens born in a litter. They are blind and helpless at first. The mother takes excellent care of her kittens, feeding them and washing them, and giving them every attention. On the tenth day after birth, the kittens open their eyes, and soon clamber out of the basket, very happy and playful. They should be left with the mother from five to seven weeks, or until she tries to wean them. Sad experience awaits the kittens at this period when they try to get their accustomed dinner. Their mother growls at their approach, and cuffs their ears energetically; so at this time we should take the mother away, and teach the kittens to lap sugared milk from a saucer. A little lime water added to the milk is beneficial. Soon we should begin to feed them three or four times a day, on bread and milk, porridge, and a little finely-minced cooked meat. The food should always be lukewarm when given them. A little later, boiled rice, brown bread and oatmeal with milk, and sometimes boiled vegetables may be given. Kittens need a soft bone to gnaw to keep their teeth sharp and clean.

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THE KITTEN AND THE FALLING LEAVES

See the kitten on the wall,
Sporting with the leaves that fall,
Withered leaves, one, two and three
Falling from the elder tree,
Through the calm and frosty air
Of the morning bright and fair.

See the kitten, how she starts,
Crouches, stretches, paws and darts;
With a tiger-leap half way
Now she meets her coming prey.
Lets it go as fast and then
Has it in her power again.

How she works with three or four,
Like an Indian conjurer;
Quick as he in feats of art,
Gracefully she plays her part;
Yet were gazing thousands there,
What would little Tabby care?

William Wordsworth

Photo by Verne Morton

SUNSHINE, KITTENS AND CONTENTMENT

Photo by Verne Morton

THE PET HORSE

THE PONY

THE pony is a hero, and bred of heroes. Wherever it may have come from, or of whatever breed, its ancestors braved and conquered dangers and endured privations which would have killed any animal less heroic. It is probable, indeed, that because of the privations which these horses underwent when in a wild or semi-wild state, their size was reduced and the races of ponies were developed.

Strictly speaking, a pony is a horse, fourteen and one-half hands high, or less. The finest breeds of ponies come from regions of scanty vegetation and unfavorable climate. This is true of the cold and dry climates of Russia and Scandinavia; the sterile islands of Shetland; the mountains of Wales, and northwest America, with their scanty vegetation; the heath-covered downs of Exmoor and New Forest in England; the arid wastes of the southwest United States and Mexico, and of Arabia. In all of these regions races of ponies have been developed, probably from wild herds of hardy horses. The struggle for existence under these adverse conditions was so severe a test, that all but the hardiest died from starvation. However, those which did survive were so tough and strong that they were able to give to their offspring the endurance to withstand cold or heat, scanty food and scanty water.

Thus it has happened that through generation after generation of hardening, the pony of to-day is superior in many ways to the horse which has been

more tenderly cared for by man. The pony has better feet and legs than the horse, and is more active. Since a wild horse relies for safety upon the strength of legs and feet, and the ability to flee up mountain sides, if it happens to live in such a situation, it was necessary to the pony's existence that it be thus strong and sure. I was in a stage coach once in the Sierra mountains when we met an Indian pony, heavily packed, on a very narrow mountain road. It stopped, looked at us with intelligent eyes, then looked down the precipice that fell away from one side of the road, then up the steep bank that bordered the other side. Then with quick decision, it climbed, squirrel-like, up the bank out of our way and clinging to it like a fly to the wall waited for us to pass, and afterwards climbed carefully down. My heart was thrilled with this daring performance, and I shall never forget it.

The pony is not only stronger in body in proportion than the horse, but it also lives longer. There are many records showing ponies to have reached the age of thirty-eight, forty, and even forty-five years. Moreover, the pony is more intelligent than the horse. There are many more trick ponies than horses in shows, and one reason for this undoubtedly is the superior brain of the pony, which enables it to remember and to learn many things.

Of all the ponies, the Shetland is the most used as a pet. If we could visit the home of the ancestors of our Shetland pony, we should have to journey to some very picturesque, rocky islands north of Scotland. In fact, they are so far north that they would seem to belong almost to the Arctic regions; however, the climate there is changed and moderated

LOADING A PONY WITH PEAT IN THE SHETLAND ISLANDS

From Handbook of Nature-Study

A COLLIE HERDING PONIES IN THE SHETLAND ISLANDS

by the warmth of the Gulf Stream. The islands consist of high points of rocks, and basins lying between, which have peat bottoms. Over this peat grows heather and scanty grass on which the herds of ponies feed. There are no trees and shrubs for shelter, and the ponies are never housed. They are born, and live their lives in an open field the year round. Their only protection from the wind and storm are piles of rocks, and stone walls. Because of the warm, moist atmosphere brought by the Gulf Stream into this semi-Arctic region, much rain and mist is condensed; thus the Shetland ponies have developed their long, fine hair, to protect them from moisture.

The ponies were ranging these Shetland islands before the year 872, and are supposed to have been brought from Norway in ancient times. However, ponies were found in England and Wales by Julius Caesar when he conquered the British Isles. The mustangs and bronchos of our Southwest are supposed to have descended from horses introduced by the Spaniards, and therefore have Spanish or Moorish ancestors.

HOUSE

The stable should be well ventilated, without drafts, and clean bedding of straw should be given every day. There should be a yard adjoining the stable where the pony may be let out to take exercise daily.

FOOD

In general, the pony should receive one-fourth or less of the rations given to a horse. Good, well-cured hay, and clover, are best for it. A pint of bran,

and a pint of oats may be fed twice each day for grain. About once a week a steamed bran mash may be given, and it is well to change the rations slightly by feeding two or three carrots in addition to the regular grain ration occasionally. Corn meal, with the bran, may be used instead of oats, if the latter are not to be had. Corn meal two parts, and one of cottonseed meal, with a small amount of wheat bran, may sometimes be given to change the feed.

The pony's stomach is small, and when more food is packed into it than it naturally holds, the pony becomes podgy, and no longer travels easily or freely. A good quality of hay is excellent for keeping the stomach and bowels in order. The pony should have free access to grass as often as possible in summer.

CARE

The pony should be fed with absolute regularity, and should not be used for a short time after its meal. If it is not warm, it should be watered before feeding; in the winter the water should have the chill taken off. Also in winter the frozen bit should be warmed before being placed in the pony's mouth; the tight-drawn, cruel, over-check rein should never be used, although a moderate check may be needed. When the pony is sweating it should be blanketed immediately if hitched outside in the cold weather, but if hitched in the barn the blanket should not be put on until the perspiration has stopped steaming. The pony should be carefully groomed, and its legs should receive more attention than the body during the grooming. In driving the pony, control it more by the sound of the voice than by the whip;

it should have daily exercise, either in driving or in its yard; if this is impossible, then its feed should be cut down somewhat while it is idle. Its shoes should be removed and reset once a month, and renewed as often as worn out; when the pony is turned out to pasture in the winter, or for a period of several weeks in the summer, the shoes should be removed, as this helps growth which repairs damage to the hoof.

It is well for the little master or mistress of the pony to learn to take care of the harness, and to learn how it goes together to fit the pony, as this will avoid many accidents. If the harness becomes muddy, or dusty, it should be brushed and sponged, and then rubbed with a cloth moistened with neats-foot oil. The patent or enameled leather ornaments should be cleaned by rubbing with a cloth moistened with tepid water, and should not be oiled. The harness must be kept free from the dirt left by sweat, as this galls the pony.

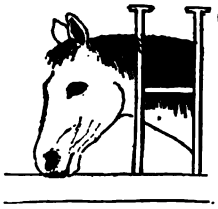
THE SHETLAND PONY

My Shetland Isle was bleak and cold,
With rocks and stones heaped high.
The heather o'er the open wold
Shone purple 'neath the rainy sky

There was my home; a sturdy foal
I roamed the peat bogs far and wide.
The rough rocks sheltered me from cold;
With scant grass was I satisfied.

My shaggy coat kept off the rain;
My herd was gay and free from care.
I ran and ran with touseled mane,—
I never saw a harness there.

THE COLT



HORSES have an interesting story as told by the fossils in the rocks of America; but we should not recognize these very ancient ancestors of our horses if we should see them, for they were not larger than sheep, and each one had four toes on the front foot and three toes on the hind foot. This first little horse with many toes lived when the earth was a damp, warm place, and when animals needed toes to spread out to enable them to walk in the mud. But as the ages passed, the earth grew colder and drier, and a long leg ending in a single hoof seemed most serviceable for running swiftly over dry places; thus it has come about that our horses of the present day walk on the nails of their middle toes, for the hoof is a toenail. In the desert of Gobi in Thibet the original stock from which our domestic horses have been bred was discovered by Col. Przhevalski. These are dun-colored ponies, with erect manes, no forelocks and with a dark stripe along the back. Very good pictures of these horses are found in the drawings made by the cave men before the dawn of history.

Since the herds of wild horses made swift flights when attacked by their enemies, colts are born with long legs so that they are able to keep up with the herd. In fact, its legs are so long that, when it grazes, the colt has to spread the front legs wide apart so as to reach the grass with its mouth. Of course as the colt grows older its neck grows longer

in proportion; for, an animal standing so high as a horse, is obliged to have a long neck in order to feed.

HOUSE

A stable well-ventilated, dry and free from draughts, should be provided for the colt in winter; and plenty of bedding should be littered over the floor.

FOOD

If it is necessary to raise the colt independently of the mother, give it milk as fresh from a cow as possible. Rich milk should never be given. Jersey milk is far too rich for a colt, since it needs a milk poor in fat. A half pint given to a colt two or three days old is sufficient, but it should be fed often. The milk should be prepared as follows: Take a dessertspoonful of granulated sugar, add enough water to dissolve it, and add three tablespoonfuls of lime water, and enough milk to make a pound; warm the mixture to blood-heat, and give one-half a teacupful every hour at first. As the colt grows older it should be given more food but less frequently. At first it should be fed twelve times, and then nine and then six times per day, but finally it may be fed four times daily. Bean or pea gruel, boiled and then put through a sieve to remove the skins is excellent food for a young colt, as is also a jelly made from boiling meal and shorts together. When three or four weeks of age, it should be encouraged to nibble ground oats. If the colt is fed milk after it is two months old, it should be given skimmed milk. A ration of sweet skimmed milk, ground oats and meal is excellent food for a growing colt. Later, grain, ground oats, and in cold weather

one-fourth the rations weight of corn meal, and a half pint of oil meal per day should be given.

CARE

Never feed sour milk, and always feed the milk from vessels that have been scalded every day. If the colt scours, two ounces of castor oil may be given, and one feeding period skipped. If there is any trouble with constipation, give half a pint of oil meal per day in the food.

The colt should be handled properly from the first, and should be taught obedience from the beginning, if it is to be a useful horse. It should never be frightened or teased. It should be taught early the use of the halter, first to lead and then to drive; and should early be made to "stand-over," and to have all its feet lifted successively and held for a time. If you need to catch the colt and lift it do not catch it around the neck, but put one arm under its neck and the other under its hams, i.e., lift it at both ends at once. A colt caught in this way will not be frightened, as when caught by the head. Always be gentle, firm and patient when dealing with your colt.

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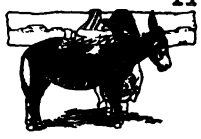
Photo by Verne Morton

THE PET COLT

Courtesy of Doubleday, Page & Co

THE DONKEY AS A MILK CARRIER

THE DONKEY



HOW interesting it would be if we could see the ancestors of our pet donkey for six thousand years back, all standing in a row, with a picture behind each showing in what country it had lived, and what sort of master it had had, and what sort of work it did. It might require years to take in such a show, and probably the ancestor at the far end of the line would be found to be a wild, fleet animal of north-eastern Africa,—maybe one of a herd feeding on an oasis in the Sahara, or grazing on the scanty vegetation of desert mountains. From this wild African species our donkeys of today are supposed to have originated. However, there are wild species found in Persia and Syria, and one in Thibet, and one in northwestern India, and perhaps our especial donkey may have come from some of these. To this day, herds of wild asses roam Persia and Armenia as they did in the times of Abraham, or when Xenophon described them four hundred years B. C. These wild creatures can run so swiftly that Nadir Shah, who lived two hundred years ago, considered that running down one of these wild creatures with greyhounds was equal in effort to winning a battle, or conquering a province. Its flesh was regarded as superior to the best venison, and its hide was made into ornamental shagreen and other valuable leather entirely waterproof.

There are pictures of donkeys in the tombs of ancient Thebes, which are excellent likenesses of

the little animals that today bear the burdens for the farmers along the Nile.

George Washington introduced donkeys to the agriculturists of the United States. Spain had long been in the lead in breeding these animals; and to export one from that country was prohibited. But the King of Spain, learning of Washington's desire, sent him two as a present. The donkey is used extensively today in the southwestern United States and Mexico, where its strength and endurance as a beast of burden make it most useful. It is there called a burro. Donkeys are used extensively in southern Europe, North Africa, and Asia Minor. The best breeds are now found in Smyrna, the Islands of Cypress, Spain and Peru.

The donkey is able to thrive upon food which would starve a horse. It can subsist on one-fourth the food necessary to keep a horse, and it can carry burdens on its back for long distances which would break down a horse; and it carries these burdens over steep mountains, and roads where a horse would stumble and fall. Its hoof is longer and narrower, and more upright than that of the horse; and the joint above it, called the pastern, is shorter and stiffer, which renders its feet less likely to become lame; and since the hoof is thicker and therefore tougher than that of the horse, it is able to climb mountains and rocky trails which would tear and bruise the horse's feet.

The donkey is a friend of the poor man, because it can pick up a living at little expense. When treated well, it is as affectionate as a dog. The mother donkey is exceedingly fond of her colt. The noted obstinacy of the animal comes probably from long generations of cruel treatment. It is

an assertion of the creature's natural strength and dignity which have not been crushed out through thousands of years of abuse. For defense, the donkey can both bite and kick. As a kicker it is most efficient, for it can bear its weight upon its front feet and kick with both hind legs, aiming just where each hoof shall strike with wonderful accuracy and precision.

The color of the donkey should be a mouse gray, with a dark line along the back bone, and a dark transverse bar across the shoulders.

For housing and feeding the donkey, follow the directions given for caring for the pony. It should be kept warmer than the pony in winter, for it suffers much with cold in our northern climate.

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OUR DOMESTIC ANIMALS, *Burkett.*

THE DONKEY

An Ass is what they called me in ancient days, long gone;
But Donkey or Burro is my present given name;
In German I am A-zel, in France I am an Ahn,
In Egypt, a Homar bedecked with beads and fame;
In Italian I'm Asceno or little Ascenello—
In every land they load and whack me just the same.
But everybody knows I am a patient fellow,
Although sometimes I will not budge, because I am so game.

THE CALF

THE CALF with its playful ways makes an attractive pet. When it is first born it is not very steady on its legs, and in a state of wildness it is hidden by its mother until it becomes strong enough to follow with the herd. It is very obedient to its mother's training, and will remain as still as if frozen unless actually attacked. The hiding of the calf by its wild mother was a necessity, since she was obliged to go far afield to graze and get the food to be changed into milk for the nourishment of her offspring; and, since she was obliged to be absent for some time, while grazing, the calf was obliged to go without nourishment for some hours; this is made possible by the large compound stomach of the calf, which if filled twice per day affords sufficient nourishment. Related to this large stomach of the calf, is the large udder of the cow, which holds enough milk to fill it; and thus she has become useful to us as a milch animal.

HOUSE

For its winter home the calf needs a well-bedded stall in a barn or closed shed, with windows and doors sufficient for light and ventilation. The shed should be built on a dry, well-drained foundation, and the ventilation should be free from draughts. It should have fresh bedding every day or so, and its stable should be kept clean. For a summer home there may be a shed to give shelter from rain and the mid-day sun in the corner of a grassy field or pasture.

Photo by Verne Morton

A PERFECT UNDERSTANDING

From Country Life in America

FEEDING THE CALF

FOOD

The first food the young calf should have is the mother's milk, as this is necessary to cleanse its digestive system. If for some reason this is impossible, one or two ounces of castor oil should be given before the calf is fed; if the calf is to be fed by the mother cow, it should have nourishment three times a day until three weeks old. But if hand-raised, it should be fed on warm, sweet milk three times a day. The first few days this should be whole milk, but it may be changed gradually to skimmed milk; the feeding periods should be regular. During the first week, from six to eight pounds of milk per day should be given, and a pound should be added to this daily ration every week with the advance in age of the calf until the food is changed. When about four weeks old the calf should be given skimmed milk altogether. The change should be made gradually; and the amount given should be increased to ten quarts daily, but not more. When it is two or three weeks old begin to teach the calf to eat a little grain. Place a handful in the pail after it has finished drinking the milk. After it has learned to eat grain, it should be given a feed box, and when it is six weeks old it should be able to take daily one pound of the following mixture:

3 parts corn meal
3 parts ground oats
3 parts wheat bran
1 part linseed meal

The calf should also be taught to take hay with the grain. Let it nibble at sweet alfalfa or common clover hay. After the first or second months, allow it to have access to cool, clear water.

CARE

If strong and healthy, the calf needs fresh air and exercise, so there should be a large yard adjoining its stable in which it can run about. Its manger should be kept clean, and the pail from which it is fed should be scalded every day.

It is much easier to teach a calf to eat if it is not allowed to take its food from its mother after the first meal. If it is troubled with looseness of the bowels, less food should be given for a day or two. If troubled with lice, crude petroleum should be rubbed along the backbone, and underneath just where the legs join the body.

To remove the horns of the young calf: As soon as the young horn can be felt by the hand, it should be removed; the hair should be clipped from around it, then take a stick of potash, carefully wrapped, so that it will not burn the fingers, dip in water and rub it upon the tip of the young horn until the skin begins to loosen and becomes red. Be very careful not to touch the skin surrounding the horn with the potash. This need not be applied but once.

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Courtesy of Doubleday, Page & Co.

DEER

From Country Life in America

A FALLOW DEER

THE FAWN

MERCILESS in the past has been the slaughter of deer by our hunters and it seems quite miraculous that we still have in North America in our wildernesses and forest preserves, three native species of deer. The moose is the largest; it has a short neck, and its food is largely twigs of trees and bushes; the caribou lives on the cold, dry plains of British America and is the reindeer of America, although it has never been domesticated. But the most common of the three species is the Virginian deer, which once dwelt everywhere in our forests, and still breeds in our forest preserves in abundance. This is the deer which we are most likely to have as pets, although the fallow deer of Europe has been introduced into America as a park pet.

Our Virginia deer, also called the white-tailed, has a coat that is khaki colored, as is shown by the numbers of hunters in khaki coats which are shot by mistake each year during the hunting season. The underparts of the animal are white, and the fawns are spotted with white. The little fawn needs to remain hidden while the mother feeds, and its spotted coat looks like the ground flecked with sunshine, and so it is protected from the sight of its enemies. While the large, liquid eyes of the deer are fairly keen, yet these animals trust to their sense of smell and hearing to give them warning of their enemies, from whom they escape by flight. They are rapid runners, and tremendous jumpers and excellent swimmers. The farmers whose lands ad-

join our forests preserves cannot protect their crops with fences of ordinary height from visits of this deer. The stags when hard-pushed are desperate fighters. However, their great antlers are used chiefly in fighting rivals when competing for does.

The growth of the stag's antlers is one of the most remarkable occurrences in animal physiology. The antlers are shed each year, and grow anew in something less than three months. They are at first covered with the "velvet," which is a skin supplied with blood-vessels to carry nourishment to the growing tissue. As the antlers complete their growth, the blood supply to the velvet is checked, and the velvet withers and ravels off. Stags are very shy during the period when their antlers are growing, for they are helpless if attacked, since their new antlers are extremely sensitive and tender.

HOUSE AND RANGE

If deer are kept in a park, a dry, well-drained shelter-shed, kept well-bedded, will prove sufficient. There should be plenty of fresh clean water in the park or enclosure, so that the deer may bathe as well as drink. A large park is needed if a herd of both sexes are kept together. If the park is small, one stag with several does will thrive in it; but close quarters often leads the stags to fight each other, they are especially quarrelsome at the beginning of autumn.

FOOD

In a park the deer find the grass and foliage sufficient food; in addition they need a slab of rock salt to lick, and dry, clean, large bones to chew, if the shed antlers are taken away. In winter hay, oats, apples,

turnips, beets, potatoes, carrots, cabbage, or prunings from the orchard can be given to supplement browsing.

CARE OF THE FAWN

Usually two fawns are born at a time in late spring, in some sheltered thicket. For a few days the fawn simply lies close and quiet, and is fed by the mother, and does not stir unless she gives the signal. There is the closest possible relation between the mother doe and her young.

It is only when taken very young that a fawn makes an attractive pet. It soon learns to know who feeds it, and will follow its little master or mistress around with devotion. It is also playful and very amusing. In general, it should have the treatment and food given the calf.

Although the fawn when young is attractive as a pet, it does not remain so. Before it is half grown it is likely to have become dangerous; in fact, Dr. Hornaday, who has had extensive experience with deer of all kinds, regards them as too dangerous to be used as pets.

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THE COSSET LAMB

THIS playful little creature makes a delightful comrade, and becomes very much attached to its boy and girl playmates. As a matter of fact, the older lambs have games which they play constantly by themselves. One is a true game of "Follow-my-leader." Each lamb runs as fast as it can, pushing ahead to attain the place of leader; when it succeeds, it leads its followers a hard chase over most difficult places, across streams, over stone piles, and logs, or any other obstacles it may find. This game is of great use to the lambs that belong to the wild flocks; because, when sheep are attacked by wolves or other creatures, the leader, who is a wise old sheep, leads the flock over streams and chasms and rocks in a flight which leaves the enemy behind because of the difficulties of the trail.

The other game which lambs play is peculiar to stony districts. The lamb climbs to the top of a boulder, and its comrades gather around and try to butt it off. The one who succeeds in doing this climbs the rock and is "it," and strives hard to keep its position. This kind of training would enable a sheep to climb to a difficult position and protect itself against an enemy trying to reach it from below. A pet lamb of ours had a game which consisted in jumping across thresholds. It would run from room to room and at the thresholds would leap high in the air, as if it were jumping a fence or rock. The lamb's long legs serve to enable it to follow its

Photo by Verne Morton

A NOONDAY REST

Courtesy of Doubleday, Page & Co.

FEEDING LAMBS FROM A BOTTLE

mother when it is only a few hours old. A sheep shows anger by stamping on the ground with its front feet, but its weapon of defense is its hard head armed with horns.

HOUSE

The lamb is a timid little animal and easily frightened, and cannot be kept in a dark, poorly ventilated barn or shed, neither can it endure rain or cold. It should have a clean, dry, well-ventilated, sunlighted place to sleep in. A stall in the barn does very well, or a shed may be built for it. If a lamb is not allowed to run about the premises, it should have an open yard in which to take its exercise; and in the summer it should be given shade. Straw bedding, changed often, should make the sleeping place comfortable.

FOOD

Young lambs are very delicate, and if one must be raised by hand it must be fed from a bottle with a rubber nipple. Modified cow's milk, heated to 103° F. should be given in small amounts but often. At the age of ten days or two weeks the lamb will begin to eat a little grain; this should be given twice daily, but care should be taken not to give any more than is eaten. After the lamb has learned to eat grain, feed the following ration:

5 parts of cracked corn
5 parts of wheat bran
1 part of oil meal, coarsely ground

When beginning to give full feed, the grain should be given sparingly, and hay liberally. At the

beginning, feed one-fourth pound of grain daily, and gradually increase this to one pound. An older lamb may be fed corn silage or beets and other roots.

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THE FLOCK, *Mary Austin.*

On the grassy banks
Lambkins at their pranks;
Woolly sisters, woolly brothers
Jumping off their feet
While their woolly mothers
Watch by them and bleat.

Christina Rossetti.

A frisky lamb
And a frisky child
Playing their pranks
In a cowslip meadow.
The sky all blue
And the air all mild
And the fields all sun
And the lanes half shadow.

Christina Rossetti.

From Country Life in America

"DRINK, PRETTY CREATURE, DRINK"

Photo by Verne Morton

TAKING A DRIVE

THE GOAT

WE CAN never really become acquainted with the goat until we see it in its native mountains. The steeper and rougher the mountains the better for the goat, for its muscles are like steel springs, and it leaps up and down steep places, getting a foothold on narrow ledges, and seems to enjoy looking down from dizzy heights.

If we think for a moment, we can easily understand this development of agility on the part of this animal. In all wild places there are even today animals of prey which feed upon small mammals of sweet flesh, like the goat and sheep. So it is much to the advantage of the goat to be able to seek safety in the rocky fastnesses of mountains where, if followed by wolf or panther, it can escape by leaping across chasms, or find refuge on some shelf of rock where the enemy cannot follow. As a natural result of this, the wild goat through the ages has been obliged to live upon the scanty verdure of the rocks, and to be able to derive nourishment from moss and bark, and even from those poisonous herbs like the hemlock that Socrates drank as a death potion. So we need not be surprised when we see goats eat posters, newspapers, or old clothing. It is a part of their nature to try anything in their reach, on the chance that it may prove a nourishing morsel.

Nor need we wonder if we see our goats climbing to the roofs of sheds, or walking along the top rail of a fence, or if they are able to walk a tight-rope

in the show. It is most unnatural for a goat to stay upon the flat ground; also it is never dizzy, and is perfectly sure of its footing in hazardous situations.

Goats are sagacious animals, and a few are often kept with the great droves of sheep on our western ranches. The goat's office in a flock of sheep is that of leader, and the sheep have perfect confidence in him in this respect. For instance, a goat will lead a herd of sheep across a single log above a mountain torrent with perfect safety. If the herd is attacked by wolves or other enemies, the goat will give warning by its cries, while sheep are always silent under such an attack.

Perhaps none of our domestic animals have been so widely useful to man the world over as the goat. When man was a Nomad he took with him in his wanderings his herd of goats. He drank their milk, ate their flesh, wove their hair into clothing, made garments of their pelts, and used their skins for bags in which to carry a supply of water. These goat-skin waterbags are often seen in Mohammedan countries about the Mediterranean at the present day. Indeed, in the Orient, all these uses of the goat mentioned above continue at present. Even in cities of Southern Europe herds of goats are driven along the streets to be milked at the doors of customers. A common sight in Naples is a goat climbing two or three flights of stairs in a tenement, so as to reach the door of her patron.

Many countries have developed their special breeds of goats. The Swiss farmers have found this animal especially adapted to the mountainous pastures; and in some isolated valleys, encompassed by mountains, like the Saane and Toggenburg valleys, there have been developed breeds of goats

which have won world-wide reputations. In Asia Minor the long-haired Angora goat has been developed; and in Cashmere has been bred the long-haired goat whose fleece is used for the making of the famous Cashmere shawls.

In America we have a native wild goat, although it is more nearly related to the antelope than to the goat family; it lives in the Rocky Mountains and the Cascade ranges. It has white shaggy hair, and black feet, eyes and nose, and slender but efficient black horns. There have been some very exciting stories written and told about the adventures of hunters when pursuing this animal.

"As playful as a kid", is a common expression, and is founded upon observation. The only way for the kid to develop its steel-spring muscles for maturity, is to keep in constant activity when young. In fact a kid goes into training very shortly after it is born.

HOME

The winter home of the goat needs to be warm and light, and be funished with a plentiful supply of dry bedding. It should be cleaned often, so that it will be dry and fresh, otherwise it becomes bad smelling. The goat, of all the animals, must have plenty of fresh air and exercise, so the year round it should have access to a yard or field where it can browse and roam about. During the summer it does not need to be housed. The fence about the pastures should be well-made, and with no boards leaning up against it, for the goat can walk up a leaning board and jump over a fence quite as easily as a boy.

FOOD

The goat is not dainty about its food, and eats what other animals refuse. However, it thrives better on good food, such as corn fodder, cowpea, clover hay and alfalfa. Oats, corn and bran are valuable as winter food. The goat likes more salt than do sheep and must have a plentiful supply of water at all times. If the goat is housed in the winter, give it twigs of hazel, box-elder, or maple to browse upon for entertainment.

CARE

The goat should never be teased. This spoils its temper, as well as its attractiveness. If it is an Angora goat, it should be combed and washed about twice a month during the summer. All goats like to be caressed. If treated kindly, bucks will learn to draw their boy-masters in a carriage or cart. But if teased, they often refuse to work, and will die sooner than yield.

CARE OF THE KID

A kid of a milch goat should be separated from the mother soon, and fed from a nursery bottle. It should be weaned gradually. The Angora kid should be weaned when four months old. The kids especially need plenty of fresh air, a field for play and exercise, and a dry, comfortable place in which to rest.

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From Country Life in America

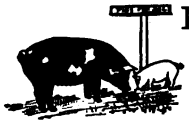
A SPAN OF ANGORAS

Photo by Verne Morton

A HAPPY FAMILY

THE PIG

"A nice little pig with a querly tail,
All soft as satin and pinky pale,
Is a very different thing by far,
Than the lumps of iniquity big pigs are."



THE change noted in this rhyme between the little pig and the big one is not altogether the pig's fault, but rather because of the poor care given him by ignorant people who make him a creature of filth.

A little pig makes a charming pet. It is pretty and neat and very intelligent. It will soon know the little master or mistress who feeds it, and will follow those it loves like a devoted dog. It is sufficiently clever so that it may be taught many tricks, and will repay patient training.

One of the most interesting things about a pig is its nose; this fleshy disk surrounding the nostrils is a most sensitive organ of feeling. By its use a pig can select corn from chaff; at the same time it is so strong that with it the ground may be rooted up in search for food. A pig's sense of smell is as keen as that of a dog, and there are many instances on record of a pig being trained as a pointer for hunting birds; it shows a keener intelligence in this capacity than do dogs. In France, pigs are taught to hunt for truffles, which are edible fungi growing upon tree roots far below the surface of the ground.

Though the pig's eyes are small, they gleam with intelligence. Pigs are often trained for shows, by teaching them how to pick out cards and count, and many other intelligent tricks. When the pig is allowed

to roam in the woods, it lives on roots, nuts and forage, being especially fond of acorns and beechnuts; and it has a remarkable record for destroying rattlesnakes. The pig has quite an extended language which its little master will become interested in studying. There is the constant grunting which keeps the herd of swine together; there is the squeal of anger and discontent; the satisfied grunt of enjoyment of food, the squeal of terror, and a nasal growl of defiance, and many more vocal expressions.

FOOD FOR THE LITTLE PIG

The pet pig is usually one that has in some way become separated from the litter, and must be brought up by hand. It should be given at first a very small quantity of cow's milk, which is luke-warm; this may be given from a nursing bottle with a rubber nipple, exactly as if prepared for a child; it should be fed every two hours, for three or four days, and after that, every three hours; if it grows and is vigorous, it may be fed every four hours; and finally it should be fed four times a day. When about three weeks of age it may be fed three times daily, but the milk must be sweet, and the trough or basin in which it is fed must be kept clean, or digestive disorders will follow. Occasionally the milk may be replaced with bran or shorts made into a gruel; later, grain soaked for twenty-four hours may be fed. As it grows older, it should have plenty of green food, which may be in the form of roots of all kinds, clover or other acceptable forage. The pig is a thirsty animal, and should have access to clear water; when young cold water, especially in winter, should not be given to it.

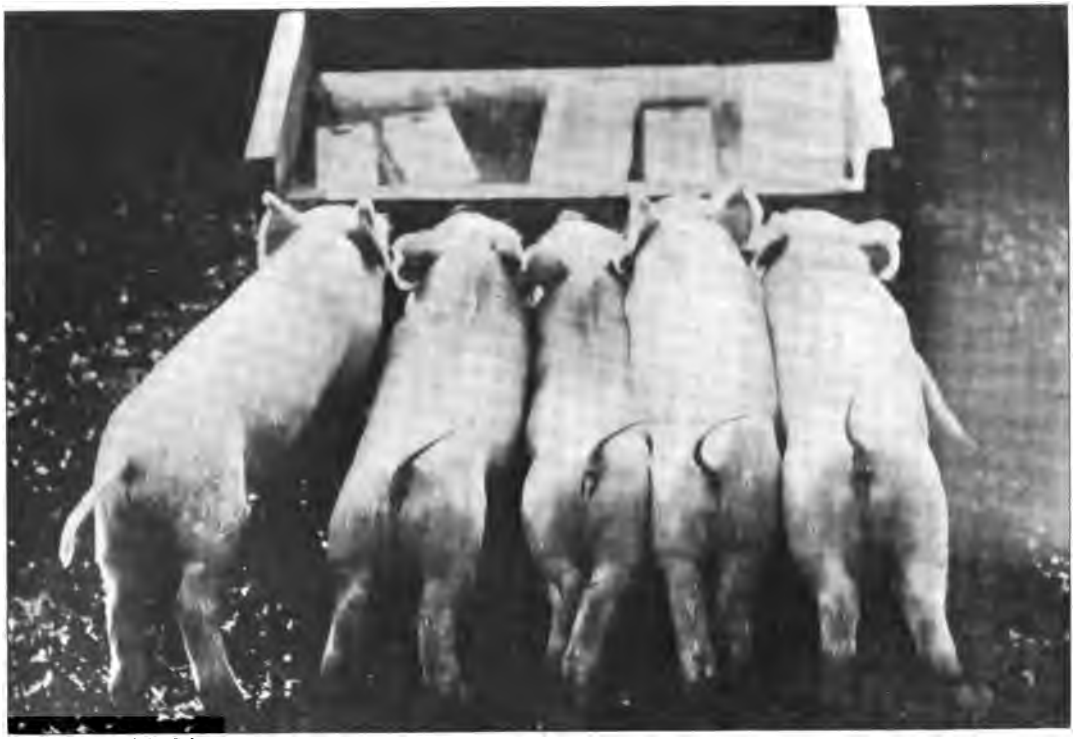


Photo by Thorndyke Colton

BOTTLE-FED PIGGIES

HOUSE

It is well to have a little portable pen for a pet pig. This may be made of boards shaped like an A tent. If the ground is dry it does not need a floor. There should be a ventilator at the top of the pen that is protected from the rain; this may be gained by placing a window near the peak on each side. A door about two feet wide should be put in one side opening into a yard fenced with chicken wire. The bottom of the pen must be arranged so that it can be kept clean and dry; if the ground is wet, it should have a floor. The house should be tight and warm in the winter, and cool and well-ventilated in the summer.

CARE

Plenty of fresh bedding should be given to the pig; this may be of straw or shavings. The bed should be separated by a board from the remainder of the pen, since the pig is a very neat animal in its habits and will not make its own bed foul. The floor should slope away from the bed. Plenty of fresh water should be given, and some shade should be provided in the summer. The pen should be cleaned every day.

If it is possible, it is best for a pet pig to be allowed free range of the premises, for only thus when he is given the full companionship which we usually give to a dog, will the pig develop his full intelligence and charm as a pet.

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MONKEYS

MANY of us are tempted to look upon the monkey as a little man; it so much resembles human beings in form and action that we endow it with human attributes. However, the dog is often mentally and morally much more like us than is the monkey.

The monkey, in a natural state, lives in the trees of the tropics, and only comes to the ground when necessary. Its long, strong hands and feet are made for grappling branches, and the muscles of the legs and arms are fitted to sustain the body of the animal as it swings from one branch to another. Some species in South America have the tail developed to seize hold of branches and help in tree travel. It is not natural for a monkey to walk upright, and it is cruel to force it into this position. It is quite impossible for the monkey to carry the head upright, because of the way it is joined to the body; the monkey naturally walks on "all fours."

Thus, as we watch the antics of this fascinating pet we must always think of the monkey as a dweller in trees, and we should give it as much of its natural surroundings as possible. We should read all the nature books and travel books that deal with the forests of the tropics, and thus learn how monkeys live when at home. Kipling's Jungle Stories tell us much of interest that is true.

Monkeys are very imitative, and are certainly not without the power of reasoning. For instance: A Professor of Physiology in the Cornell Medical Col-

Courtesy of Doubleday, Page & Co.

LOOK PLEASANT, PLEASE

Susy, a chimpanzie in the New York Zoological Gardens, noted for her intelligence and beloved by children

lege, in making some experiments upon the vitality of the body, wished to keep the monkey upon which he was experimenting awake all night to see how this would affect his physical condition; so an alarm clock was set to ring at frequent intervals during the night. In the morning the professor found the monkey fast asleep, and the alarm clock standing on its head in a pail of water.

The most common monkeys in captivity are the Bunder or Rhesus of India, and the Capuchins of South America; both of these are used by organ grinders; both are intelligent, and become very devoted to their masters. The Rhesus is the most common monkey in India; it has a short tail, and yellowish brown fur, and the old males are very disagreeable and dangerous pets. The Capuchins have their hair done pompadour, and have long, strong tails with which they climb. A Capuchin likes to hang by the tail from a branch of some very high tree, stretch out its arms and legs to keep its balance, and then drop, perhaps thirty feet, accurately seizing with its tail another branch as it lands. It is very fond of oranges, bananas and sweets. It makes a most interesting pet, although the males as they grow old develop disagreeable dispositions. In fact, it is more desirable to select a female of any species of monkey as a pet, as she is more amiable and affectionate than her mate. However, the monkeys are a sociable folk, and enjoy themselves much better if given companions of their own species.

HOUSE

The indoor cage for the monkey should be as large as possible to allow the active animal plenty of oppor-

tunity for exercise. The perches should be made of stout branches; the floor should be well-covered with straw, or sawdust, which should be renewed frequently. At the top of the cage there should be a sleeping box, which can be removed to be cleaned. The cage should be kept in an even temperature of about 75° F.

An out-of-door home can be given the monkey in our warm southern climate, and in the summer in the north. The house should be at least six feet square, and be placed in a well-sheltered position, and the floor should be raised above the ground. There should be connected with the house an outside run covered with netting. In both house and run there should be strong perches, and the whole establishment should be thoroughly cleaned often.

In placing the monkey out of doors it is often more desirable not to cage him at all, as he is so restless and active; in that case his range may be limited by fastening him to some object with a light chain, so that he can be moved from place to place occasionally.

Wherever his home is, the pet should be warm and comfortable. He should have plenty of covering, and be kept free from any dampness. He should also be kept clean.

FOOD

The monkey is fond of most of the food which we eat, but should be given little animal food. The following is recommended: Boiled rice or tapioca, baked or boiled potatoes, ripe bananas and ripe sweet apple, stale bread, occasionally a small raw onion and at all times plenty of raw carrots, as this vegetable has a very excellent effect upon the digestive system. Whole peanuts roasted may be given occasionally,

and also a half of an orange, and ripe grapes. Monkeys should be fed twice a day, in the early morning and at noon. In the morning bread should be given, and at noon bananas or other fruit. Change of food from day to day helps keep the appetite good, but bread should always be given for breakfast.

To the Ringtail monkey give whole peanuts roasted, half an orange, grapes, and a little sweet apple and boiled potatoes, lettuce or carrots, and bread. Occasionally, give egg and condensed milk beaten together, and a little lime water added now and then. Water should be given frequently.

Monkeys of different species eat different kinds of food in their wild condition; and we should read all that we can find concerning the species we have for a pet, so as to feed and treat it intelligently.

Mr. Ferdinand Engeholm of the New York Zoological Gardens who kindly gave me the above dietary for monkeys especially recommends that the individual tastes of the pet be studied and that a frequent change of food be offered.

CARE

Monkeys should never be kept in a temperature below 70°, because they are animals of the tropics, and cold and dampness bring on rheumatism and tuberculosis. They must be kept in a place entirely protected from draughts; if kept in cages, they should be large, at least four feet square, for the common Ringtail. To protect from draughts it is well to have the cage of wood on three sides, with tight floor and with the front side wired. Plenty of straw should be given for bedding.

Mr. Engeholm advises the following simple remedies when needed: To prevent constipation one-

half a teaspoonful of olive oil should be given twice a week. If the monkey is afflicted with diarrhoea, it should be given a mixture made by beating a white of egg with a little sugar, and adding a small amount of blackberry brandy.

A monkey given the proper care is washed and combed often, properly fed at regular intervals, never teased, and should be allowed as much liberty as possible. It is very sensitive, and responds readily to kindness like the dog. It resents being laughed at, but a kind master is soon regarded as a real friend from whom it dislikes to be separated.

Monkeys have many diseases, some of them incident upon the change of climate; and because this creature is so nearly like us in form, it should, when ill, be attended by a regular physician, and treated like a sick child.

THE MONKEY

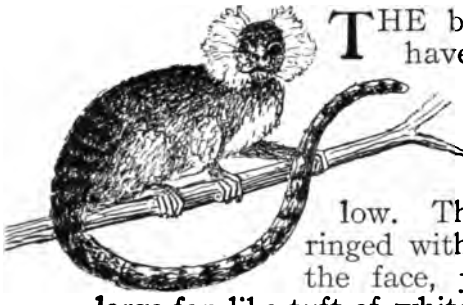
Look now at his odd grimaces,
  Saw you e'er such comic faces?
Now like learned judge sedate,
  Now with nonsense in his pate.

Ha! he is not half asleep,
  See, he slyly takes a peep!
Monkey, though your eyes are shut,
  You could see this little nut.

There, the little ancient man
  Cracks as fast as e'er he can;
Now, good-bye, you funny fellow,
  Nature's primest Punchinello!

Mary Howitt.

THE MARMOSET



THE beautiful little marmosets have their native home in Guiana and Brazil. They have long and exquisitely soft fur, striped with black on white or reddish yellow. The tail is long and full, and ringed with black. On each side of the face, just beneath the ears, is a large fan-like tuft of white hairs, giving the appearance of a peculiar headdress.

Marmosets are beautiful and gentle, but they suffer severely from cold in our climate; they become very much attached to their masters if they are kindly treated. A pet marmoset loves to sit on its master's hand with its little paws clinging to his fingers, and with tail curled about his wrist; and if chilly, it will hide beneath his coat, and cuddle up to his warm body. It is particularly fond of catching flies and eating them, and also considers cockroaches delicate morsels. A full-grown marmoset has a body from seven or eight inches long, and a tail a foot in length.

FOOD

Bananas, raw carrots, boiled potatoes, shelled peanuts, almost all kinds of fruit, Malaga grapes cut in half, meal worms and sweet crackers are all in the marmoset dietary. Once a day egg and milk mixed as if for egg-nog should be given; bread may be soaked in this mixture and condensed milk should be used.

CARE

The cage should be provided with branches for the little creature to climb around upon, and should be large enough to allow it plenty of exercise. It must have a nest box, with plenty of warm bedding. One marmoset which we saw had a little wool comfortable for its box, and it was interesting to see it get underneath this and pull it up over its shoulders and head in a truly human way.

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THE MARMOSET

I am a little marmoset!
My whiskers make a white-rosette
  On either side my face.
My longish tail with rings is set
I'll twist it round your wrist, if let,
  To hold me firm in place.
Bring all the insects you can get;
Bring also a warm coverlet,
And I will be your loving pet
  For many happy days.

Courtesy of Doubleday, Page & Co.

"A BUNNY FAMILY"

From Country Life in America

WHAR'S BRE'R RABBIT

RABBITS AND HARES

WASHING UP.

ONE winter evening quite late as we chanced to stop beside a spruce tree to look at the stars, we were startled by Thump! Thump! Thump! something striking the ground hard under the spruce. We listened; again it came imperiously, then we started to investigate, when Molly Cottontail, or probably her husband, came out from under the spruce and loped off over the snow. It was a thump of defiance we had heard, because we ventured too near the cover of this little creature. This same sound is used for warning when several are playing together and one perceives the enemy.

Even more interesting than the domestic rabbits are these little wild cottontails. In mowing our orchard one day we found a Molly Cottontail's nest, it was under a raspberry bush, and at first sight seemed lined with felt of fur and grass; but to our amazement we found this felt carpet was a coverlet for four young cottontails, which promptly fled helter-skelter in the grass; for they seemed to know when their cover was off that they were in plain sight of the enemy; and we said "What a wise little mother, to tuck in her youngesters so safely when she was obliged to leave them."

The cottontails are very well fitted for the life they lead. They are grey in color, which renders them almost invisible. They have long ears, which

are very sensitive, and hear the least noise at a long distance. The eyes are keen and placed on the bulging part of the head, so as to see in all directions. The nose is sensitive, and is always moving to pick up stray smells; and above all, the hind legs are long and strong, and enable these creatures to flee from danger with great rapidity and ease.

The cottontails like briar patches, and fields partly covered with brush, and partly with grass. They make runways through such places by cutting away the small stems and grasses. A runway is usually about five inches wide, and just high enough so the hare can flee through. These roads cross and criss-cross each other, and if a dog or fox is chasing the hare, there is little chance for it to follow in these intricate cross roads. The cottontails find the night safest for feeding and wandering and playing. They play amusing games among themselves,—something like tag, and leap-frog.

In America we have no species of true rabbits, although we call them by that name. Instead, they are hares. The difference between a rabbit and a hare is not very great structurally, although the rabbit is not so adept in running or jumping as the hare. The chief difference between the two lies in their habits. The rabbits are burrowing animals, while the hares live in "forms", which are nests on the surface of the ground, consisting of grass, beaten down or eaten out for a space large enough to accommodate the animal; the form is made in a protected situation, under a bush or tree. Hares rarely nest in holes, but sometimes, when hard pressed by dogs, they take refuge in a woodchuck burrow.

Hares and rabbits are not without means of defense. Either can fight an enemy by leaping over

it and kicking it savagely with its strong hind-feet. They can also bite, and the bucks sometimes injure each other in this manner. There is one record, at least, of a Belgian hare that butted cats like a billy-goat, until all the cats in the neighborhood were afraid of her.

VARIETIES OF RABBITS

All our many breeds of domesticated rabbits are supposed to have descended from a species that still abounds in the regions of the Mediterranean Sea. With the exception of the dog, the rabbit has been bred by man to greater variations than has any other mammal. The most noted breeds are the following:

The Lop-eared is an English breed; for at least one hundred and fifty years careful attention has been given to developing the ears of this rabbit, until they have been known to measure twenty-three inches in length, and six inches in width. These rabbits show great variety in color.

The Belgian hare is really a rabbit. It has been developed especially for size, and has been used extensively for food in Europe.

The Angora rabbit has fine, long fur; sometimes its hair is six or seven inches long, and much attention must be given to combing it in order to keep it decent. The most prized Angoras are albinos.

The Himalayan rabbit is white, with nose, ears, tail and feet black, or very dark. It is a very pretty animal, and is bred for beauty in Europe. It has no connection whatever with the Himalayan Mountains.

The Dutch rabbits are small, sweet-tempered, and handsomely colored. The cheeks, eyes and the entire body back of the shoulders are of solid dark col-

ors, often black. The hind feet, and the front feet and legs, the neck and jaws are white.

The Silver-gray breed has fur which is very thick and soft, and the color of chinchilla. The Silver-fawn and the Silver-brown are similar.

The Flemish Giant has iron grey fur above and is white beneath.

The Japanese rabbits have orange fur, and are banded with black on the hind quarters.

The Polish rabbits are albino, with pink eyes.

HOUSE

Pet rabbits are usually kept in boxes or hutches. These should be built in a way to protect the animal from the rain and cold, and at the same time to admit fresh air and to be easily cleaned. For an ordinary sized rabbit, the hutch could be at least a yard long, and eighteen inches wide and high. The ends must be draft-proof, and the roof water-tight, and the hutch floor should be raised above the ground. If the rabbits are not allowed their liberty, the hutch may be surrounded by a yard covered with wire netting.

There should be a sleeping apartment partitioned off from one end of the hutch. The hutch should be bedded down with sawdust, and on top of this, in the sleeping apartment, there should be plenty of clean, fresh straw or hay. The sawdust in the outside room will need to be renewed daily, but not so often in the sleeping room.

It is best, if possible, to allow the rabbits out-door runs. These may be made of wire netting, but it must be remembered that the rabbits are burrowers, and so the netting should be set down into the ground for a distance. If the run is small it should be roof-

ed over. In any case, if several rabbits are kept together, each should have a retiring room.

FOOD

Rabbits and hares are vegetarians. Their chief food should be hay, clover, oats, and bran; and green food, such as grass, cabbage, a little dandelion, or parsley; and roots, such as carrots, beets and parsnips. They eat the hay used for bedding, so it should be of good quality, and liberal in amount. They are especially fond of clover hay. The oats, bran or meal should be dampened so as to be crumbly, but not sloppy. Too much moist food is likely to prove fatal; in general, the drier the food the better the rabbit thrives. If there are no green vegetables, bread-crusts, either dry or soaked in water or milk, and squeezed, make good food. The oats may be given as an evening meal, the greens may be given at noon; the green food should not be wet, frosted, or weathered. When many cabbage leaves are fed, the hutch is likely to have a "rabbity" smell. Food should be given in vessels that have the edges turned inward so the rabbit cannot easily scratch the food out. These feeding pans should be kept very clean.

Water should be given in a vessel securely fastened to avoid spilling, and the water should be kept fresh. If soaked bread, or succulent green stuff is given, the water is not needed.

CARE

It is very important that rabbits be given exercise as freely as possible, if they are confined in a hutch. If they have good runways they will exercise themselves.

When handled, a rabbit should not be lifted by the ears alone. Clasp the ears or the loose skin of the back with one hand, and bear the animal's weight with the other. If treated kindly and gently, rabbits become very tame, and in many homes they have the range of the premises.

Rabbits are likely to have dropsy or diarrhoea from being fed too much green food. When attacked by these they should be fed hay and oats. They are also likely to suffer from colds and pneumonia. Mucus flows from the nose, and great care should be taken to prevent the mucus from hardening and thus stop the animal's breath. The nose should be bathed with hot water at least twice a day, and the patient should be given a warm soft bed. A little hot milk may be given, and potato parings boiled with bran. Some rabbits suffer from disease of the paws. This usually comes from filthy hutches, and may be prevented more readily than cured.

CARE OF THE DOE AND YOUNG

The doe carries her young about thirty days and her sleeping room should be kept private when a litter is expected, and she should be kept very quiet. She will make her own nest of the hay, lining it with her own fur which she pulls out for that purpose. She should not be disturbed soon after the young are born, else she may devour her litter.

The young rabbits are born blind and helpless, and are covered with very scanty soft silky fur. When the mother is off feeding, we may be permitted to peep in to see if any are dead or deformed, and if so we should remove them. After nine days the eyes of the little rabbits open. Before a month old the

youngsters can move about, and may be fed, but should not be taken away from the mother before they are two months old.

Bread and milk is good for a doe and litter. Fine bran, to which a little scraped carrot has been added, may be given after a little. Oat meal dampened may also be given. After weaning the litter, the sexes should be separated.

For References see those for Guinea Pig.

MOLLY COTTONTAIL

I am little Molly Cottontail, my fur is nice and gray,
And if to see me you should fail; I was meant to be that way.
I look just like the hay.

My ears are very, very tall when I listen for my foe
And down along my back they fall when I am lying low.
But every sound I know.

My eyes are placed so I can see behind and front as well.
My nice nose wabbles constantly—my enemy to smell—
Before he comes pell mell.

I have some bunny comrades gay, by night we jump and run.
Leapfrog and tag, we like to play and have whole loads of fun.
And fear not dog nor gun.

For we always have a guard, a sentinel to peer,
Who thumps the ground so hard that all of us can hear
If an enemy comes near.

We flee through briar and thorn, in runways none can follow,
My home is in a cosy form down in the grassy hollow,
Where all the weeds run fallow.

And there I make the nest for my bunnies, blind and wee.
I pluck the soft fur from my breast to cover them when it is best
That I should elsewhere be.

THE GUINEA PIG

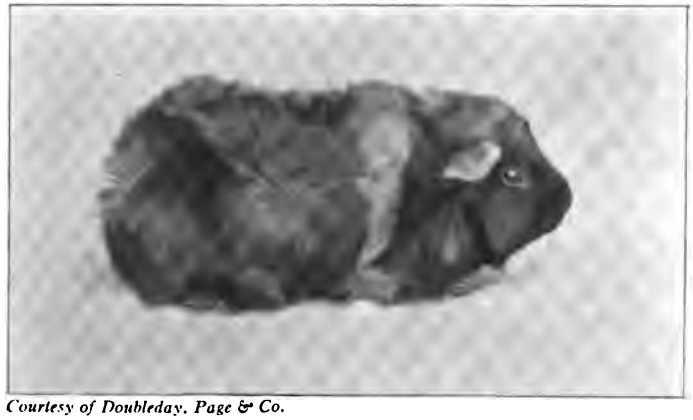
HESE compact little rodents are related to the rabbits. Indeed, in Patagonia there is a species with long legs very much like those of a hare, a distinct tail and long ears. So that whatever this little animal is, it is not a pig, nor does it come from Guinea; for South America is the native land of the Guinea pig and its near relations; and they dwelt there long before man came, for we find their skeletons among the fossils of that region.

The cavy family is a large one, containing many species, some of which are not much larger than mice, and others of all sizes up to that of a half-grown pig. These many species have differing habits. Some live in the mountains with dens in the rocks; others live in the rich river valleys, and do much damage to crops; others live mostly in the water, while many inhabit the high table lands. Many of the lofty plains of the Andes mountains are so undermined by the burrows of the cavies, that it is dangerous to attempt to cross them on horseback, since the horse is likely to fall and break a leg. The prairie dogs make some of our western plains likewise dangerous.

Although some species of cavies feed during the day, most of them feed during certain hours of the night. Their food consists of roots, and many kinds of vegetables and fruits. One species in Patagonia has been known to climb trees to feed upon their fruit, but this is a very unusual cavy accomplishment.

From Country Life in America

WHITE PERUVIAN GUINEA PIG



Courtesy of Doubleday, Page & Co.

ABYSSINIAN GUINEA PIG

Cavies form a prized article of food among the South American Indians. Our common pet is supposed to have been developed from the species called "Cutler's cavy," which had been domesticated in ancient times by the Incas of Peru; mummies of cavies are found in their cemeteries.

While many of the species, in a wild state, breed only twice per year, our domesticated varieties produce their litters about every two months. An interesting thing about the little Guinea pigs is that they are most precocious babies; they are fully dressed in long hairy coats, and have their eyes open when they are born. They are quite capable of running along beside the mother when they are but a few hours old, and they reach their full growth in from three to five months.

The best known varieties of this pet are as follows: The English, which has a short, smooth coat, like the original wild cavy, and with varying colors. The Abyssinian which has a rough coat, arranged in cowlicks of rosettes. The Angora which has a smooth coat of long, soft hair, and occurs in many colors and patterns. The Peruvian has the long hair of the Angora, and the rosettes of thc Abyssinian, and is a most frowsy little creature. While all these varieties may have several colors, there are those of one color which are called self-colored; and there are albinos with white hair and pink eyes in all the breeds. The colors recognized are the agouti, consisting of black or brown hairs tipped with yellow, black, chocolate, or brown and yellow.

HOUSE

The Guinea pig should be kept in a hutch inside of a house or shed of some kind. It cannot stand

exposure to the cold, and should not be kept where the temperature falls below freezing. An inverted box a foot square with a six-inch hole in the side may be used as a nest for one Guinea pig. It should be filled with straw or hay.

FOOD

Guinea pigs live exclusively on vegetable food. They are very fond of fresh grass, lettuce, celery leaves, beet tops, plantain, watercress, dandelions and parsley. Apples are also appreciated now and then. But if we wish to keep our Guinea pigs thoroughly well, we will furnish them with a constant supply of carrots. Grains of various sorts may be given, especially oats, either in the natural state or in the form of rolled oats. When feeding on the juicy vegetables the cavies do not drink much, but it is best to keep a fresh supply of water always within reach.

CARE

Each house may contain several females, but only one male, for the males are given to fighting each other desperately. The long-haired varieties need much personal attention; their hair should not be combed, but should be brushed downwards with a soft hairbrush. A tooth brush is needed to properly comb the rosettes of the Abyssinians and Peruvians.

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THE RED SQUIRREL

Just a tawny glimmer,
A dash of red and gray,
Was it a flitting shadow,
Or a sunbeam gone astray!

It glances up a tree trunk,
And a pair of bright eyes glow
Where a little spy in ambush
Is measuring his foe.

I hear a mocking chuckle,
Then wrathful, he grows bold
And stays his pressing business
To scold and scold and scold.

SQUIRRELS

FORMERLY gray and black squirrels were as common throughout our country as is the red squirrel today, and even more so; but these larger species have been hunted to such an extent that we rarely see the gray squirrels except as protected creatures in parks; and the black squirrel has disappeared except in a few localities. The red squirrel has, because of its small size and greater cunning, escaped this sad fate.

The red squirrel is just a playful, natural-born rascal, but perhaps the most attractive rascal in the animal world. He is a great thief, and would much rather steal his food than to gather it, even though it caused him more effort. In fact, he enjoys strenuous effort always, especially in a bad cause. The chipmunk, white-footed mice, gray squirrels, and especially the blue-jays, are the victims of his thieving. He will spend a whole morning watching a blue jay or a chipmunk in order to discover where they hide their stores; but if one of them tries to steal his stores it is quite another matter, and he becomes so indignant that he scolds for an hour after.

The gray squirrel is not so quick mentally or physically as is his red cousin, neither is he so mischievous or suspicious. Although he lives in holes in trees he wishes plenty of room, and so hollows out a good sized nest which he beds down with leaves. Several may live together in such a nest. They also make nests in summer among the branches of trees; these they build of leaves and small branches in layers, roofed with leaves to protect from rain.

From Country Life in America

FEEDING THE GRAY SQUIRREL

The squirrel has two pairs of gnawing teeth, which are long and strong, and he needs to gnaw hard substances with them constantly or they will grow so long that he cannot use them at all, and will starve to death. He is very clever about opening nuts so as to get all the meats. He usually opens a hickory nut by making two holes which tap the cavities which contain the meats. In walnuts, or butternuts, which have much harder shells, he makes four small holes, one opposite each quarter of the kernel.

The young are born in a protected nest, usually in the hollow of a tree. There are from four to six young in a litter and they appear in April.

It is quite useless to try to tame a red squirrel unless taken when young. The gray squirrels, on the contrary, will become very tame, and will soon learn to take food from the hand of the master or mistress.

HOUSE

It is wicked to keep such an active creature as a squirrel in an ordinary small squirrel cage, even though it be provided with a wheel. The way to get the most pleasure from pet squirrels is to give them their freedom in the trees about the grounds, and tame them by feeding. If the squirrels must be confined, they should be kept in a cage of chicken wire of half inch mesh, and it should be at least six feet square. At one side near the top there should be a nest box about one foot square, with a hole at one side near the top, about three inches in diameter; the box should contain dried grass or leaves. In the cage there should be branches spread across so that the captives may leap and play upon them. A pair may be kept in such a cage, but there should be two

nest boxes. A wheel may be placed in this home for the amusement of the little prisoners.

FOOD

The gray and red squirrels take the same kind of food. They should be given an abundance of nuts with hard shells, like walnuts, butternuts and hickory nuts, so as to keep their long teeth from growing too rapidly. They are also fond of chestnuts, and acorns, and will learn to eat peanuts. They are fond of berries, apples, lettuce, and meal worms. A bone with a little uncooked meat on it should be given once or twice a week. Corn, bread and milk, bread crusts, and dry breakfast food are also relished. Lumps of hard plaster should be kept accessible for health's sake and for sake of the teeth.

A dish of fresh water should always be kept where the squirrel can get at it.

A baby squirrel may be reared by keeping it in a warm nest in a box fitted with batting or wool. It must be fed at first with warm, fresh milk from the point of a small teaspoon. The milk should be of blood temperature. After a little, give bread soaked in warm milk. As soon as the gnawing teeth have well started, nut meats may be given. Lumps of plaster should be given also.

CARE

The cage should be kept clean; the nest boxes should be cleaned and filled freshly with bedding once a week during the summer; but it is best not to disturb the nest boxes during cold weather. Fresh bedding should be placed in them about the first of March as a preparation for the young squirrels.

The gray squirrels, and sometimes the red squirrels, will breed in a cage, as described. Unless two squirrels live happily together, it is best to keep them in separate cages, as they are likely to injure each other.

FURRY

His story as recorded in

THE PET NOTE-BOOK

*Furry was a baby red squirrel. One day in May his mother was moving him from one tree to another. He was clinging with his little arms around her neck and his body clasped tightly against her breast, when something frightened her and in a sudden movement, she dropped her heavy baby in the grass. Thus, I inherited him and entered upon the rather onerous duties of caring for a baby of whose needs I knew little; but I knew that every well-cared for baby should have a book detailing all that happens to it, therefore, I made a book for Furry, writing in it each day the things he did. If the children who have pets keep similar books, they will find them most interesting reading afterward, and they will surely enjoy the writing very much.

*From the Author's "Handbook of Nature-Study".

May 18, 1902—The baby squirrel is just large enough to cuddle in one hand. He cuddles all right when once he is captured; but he is a terrible fighter, and when I attempt to take him in one hand, he scratches and bites and growls so that I have been obliged to name him Fury. I told him, however, if he improved in temper I would change his name to Furry.

May 19—Fury greets me when I open his box, with the most awe-inspiring little growls, which he evidently supposes will make me turn pale with fear. He has not cut his teeth yet, so he cannot bite very severely, but that isn't his fault, for he tries hard enough. The Naturalist said cold milk would kill him, so I warmed the milk and put it in a teaspoon and placed it in front of his nose; he batted the spoon with both forepaws and tried to bite it, and thus got a taste of the milk, which he drank eagerly lapping it up like a kitten. When I hold him in one hand and cover him with the other, he turns contented little somersaults over and over.

May 20—Fury bit me only once to-day, when I took him out to feed him. He is cutting his teeth on my devoted fingers. I tried giving him grape-nuts soaked in milk, but he spat it out in disgust.

He always washes his face as soon as he is through eating.

May 21—Fury lies curled under his blanket all day. Evidently good little squirrels stay quietly in the nest, when the mother is not at home to give them permission to run around. When Fury sleeps, he rolls himself up in a little ball with his tail wrapped closely around him. The squirrel's tail is his "furs,"

which he wraps around him to keep his back warm when he sleeps in winter.

May 23—Every time I meet Uncle John he asks, "Is his name Fury or Furry now?" Uncle John is much interested in the good behavior of even little squirrels. As Fury has not bitten me hard for two days, I think I will call him Furry after this. He ate some bread soaked in milk to-day, holding it in his hands in real squirrel fashion. I let him run around the room and he liked it.

May 25—Furry got away from me this morning and I did not find him for an hour. Then I discovered him in a pasteboard box of drawing paper with the cover on. How did he squeeze through?

May 26—He holds the bowl of the spoon with both front paws while he drinks the milk. When I try to draw the spoon away, to fill it again after he has emptied it, he objects and hangs on to it with all his little might, and scolds as hard as ever he can. He is such a funny, unreasonable baby.

May 28—To-night I gave Furry a walnut meat. As soon as he smelled it he became greatly excited; he grasped the meat in his hands and ran off and hid under my elbow, growling like a kitten with its first mouse.

May 30—Since he tasted nuts he has lost interest in milk. The nut meats are too hard for his new teeth, so I mash them and soak them in water and now he eats them like a little piggy-wig with no manners at all. He loves to have me stroke his back while he is eating. He uses his thumbs and fingers in such a human way that I always call his front paws, *hands*. When his piece of nut is very small he holds

it in one hand and clasps the other hand behind the one which holds the dainty morsel, so as to make it safe.

May 31—When he is sleepy, he scolds if I disturb him and turning over on his back, bats my hand with all of his soft little paws and pretends that he is going to bite.

June 4—Furry ranges around the room now to please himself. He is a little mischief; he tips over his cup of milk and has commenced gnawing off the wall paper behind the book-shelf to make him a nest. The paper is green and will probably make him sorry.

June 5—This morning Furry was hidden in a roll of paper. I put my hand over one end of the roll and then reached in with the other hand to get him; but he got me instead, because he ran up my sleeve and was much more contented to be there than I was to have him. I was glad enough when he left his hiding place and climbed to the top shelf of the bookcase, far beyond my reach.

June 6—I have not seen Furry for twenty-four hours, but he is here surely enough. Last night he tipped over the ink bottle and scattered nut shells over the floor. He prefers pecans to any other nuts.

June 7—I caught Furry to-day and he bit my finger so it bled. But afterwards, he cuddled in my hand for a long time and then climbed my shoulder and went hunting around in my hair and wanted to stay there and make a nest. When I took him away, he pulled out his two hands full of my devoted tresses. I'll not employ him as a hairdresser.

From Country Life in America

HAVE A PEANUT!

From Country Life in America

DARING FATE!

A Red Squirrel at the Bird's Drinking Dish

June 9—Furry sleeps nights in the top drawer of my desk; he crawls in from behind. When I pull out the drawer he pops out and scares me nearly out of my wits; but he keeps his wits about him and gets away before I can catch him.

June 20—I keep the window open so Furry can run out and in and learn to take care of himself out-of-doors.

August 20—Furry soon learned to take care of himself, though he often returns for nuts, which I keep for him in a bowl. He does not come very near me out-of-doors, but he often speaks to me in a friendly manner from a certain pitch pine tree near the house.

There are many blank leaves in Furry's note-book. I wish that he could have written on these what he thought about me and my performances. It would certainly have been the most interesting book concerning squirrels in the world.

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THE CHIPMUNK

WHEREVER this little ground squirrel is found, he is easily tamed, and the best way to keep him for a pet is to let him live out of doors under natural conditions, and work gradually into his confidence through feeding him. We have for years had such intimate chipmunk friends, and have enjoyed them far more than if they were caged. They soon learn to know members of the family; and one of the chief joys of such a relationship has been the way the mother has taught the youngsters to regard us as friends. I know of no more delightful experience than to have one of these young chipmunks, a little soft striped ball sit up in front of me as I rest on a garden bench, looking eagerly for a donation from my hand.

Miss Irene Hardy, of Palo Alto, Cal., has had marked success in making pets of the little chipmunks of the Sierras. One called Chipsy was especially interesting. He was allowed the freedom of her room, and after she had filled the dish on the table with English walnuts, he would keep himself busy for a long time stealing and hiding them. His originality in finding hiding places was remarkable. Once he managed to get his nuts and himself into a covered bandbox on the closet shelf and stored his precious walnuts in the velvet bows of a bonnet. His unsuspecting mistress wore the bonnet thus decorated to church and did not discover the work of her new milliner until after she returned.

Photo by Verne Morton

PET CHIPMUNK FILLING HIS CHEEK POUCHES WITH HICKORY NUTS

Photo by Irene Hardy

CHIPSY

A pet Sierra chipmunk giving his favorite performance on a tumbler

The chipmunk has cheek pouches which the squirrel lacks, and in these pouches he carries out the soil which he removes in making his burrow as well as carries in his store of nuts and grain. The burrow is usually made in a dry hillside. The entrance is just large enough to admit the chipmunk's body, but widens to a nest which is well-bedded down. There is usually a back door also, so that in case of necessity, the inmate can escape. In this nest, the chipmunk stores nuts and acorns, so that when he awakes during his long winter's sleep he finds refreshment near-by. The chipmunk is not so noisy as the red squirrel, but he can cluck like a cuckoo when he is gathering nuts, and he can chatter a great many things which we should like to understand. When he eats, he holds his nut in both hands, and makes himself into a little bunch with his tail curled up his back.

HOUSE

If in the country, and there are no cats about, the chipmunks may be trusted to provide their own homes. Next to entire freedom it is most desirable to let a chipmunk have the freedom of one room in which there are nooks where he may hide and make his nest. If it is necessary to keep this pet in close confinement, the cage should be large and made of fine chicken wire, such as described for the red squirrels, and should be fitted in a similar way with nest box and branches. A chipmunk will not live long in a small cage. The bottom of the cage should be cement, otherwise the captive will burrow out. Cover the bottom of the cage with a foot or so of loose soil, so that the pet can burrow in it at his pleasure.

FOOD

Beechnuts, hickory nuts, sweet acorns, and in fact, almost any kind of nut is relished by the chipmunk. It is also fond of cherries and cherry-pits. Apples (including the seeds) berries, carrots, almost any breakfast food, bread crusts, and occasionally a bone with a little meat upon it may be given.

CARE

If confined to a cage or room, the chipmunk should have access to fresh water. It is natural for this animal to hibernate, and it is best to let him have a cold room in winter so that he can go to sleep when he gets sleepy; and plenty of food should be at hand in case he wakes up.

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A CHIPMUNK CONVERSATION

"Little chap all dressed in stripes so gay
Pray tell me how do you do today—
You have the mumps I fear."

"Little girl, to chat I cannot stay
My pouches are filled, I must away
To my cellar for winter is near."

Photo by O. L. Foster

A FLYING SQUIRREL

Photo by Eugene Barker

A TAMED FLYING SQUIRREL COMING
TO ITS FOOD BASKET AT NIGHT

FLYING SQUIRRELS

FLYING squirrels are the original inventors of the aeroplane. Thousands of years before human beings ever thought of such things, these little animals had tasted well this mode of travel. The flying squirrel has very much the same structure as other squirrels, except that there is a fold of skin along the sides, connected with the fore and hind legs, so that it can be extended by spreading the legs wide out when the creature leaps. The great Audubon has given us interesting accounts of how these aeronauts leap from the top of one tree to the base of another fifty yards away, making a curve upwards at the end so as to land among the branches. Dr. Eugene Barker who has made a special study of these squirrels, declares that they can turn at will, at sharp angles when flying, the tail being held out stiffly and seeming to serve as a rudder.

The flying squirrels are night folk. They usually sleep during the day, and about nine o'clock in the evening awake, and are very active. They nest in cavities in trees, usually rather high up. Often they take possession of an abandoned woodpecker's nest or some other "cave for rent", using even bird boxes. They frequently make their nest in a dead tree, cutting out a cavity with their strong teeth until it is large and commodious; the entrance is small, and preferably beneath a branch, where it is not too obvious. The nest is lined with fine moss or other

soft material. These squirrels are sociable little folk, and several may live in such a nest. They also make a summer nest in the trees, or notably in high grape vines. It is made of finely shredded bark with very thick walls, and with a cosy little pocket at the center in which to cuddle.

At the writing of this, a flying squirrel family has taken possession of our garret. It is rather exciting to reach into a wall-pocket, expecting to get some cotton-batting, and have a little creature pop out and cling to the rafter above your head, and gaze at you with its great, soft eyes, as if asking why it was thus disturbed. From my own experience, I should say that its fur was the softest and finest that covers any animal; it certainly feels softer than any cotton-batting. The favorite gathering place for this family is over our sleeping porch, and often in the coldest weather we hear them hopping around at night, so we know they do not really hibernate.

The young are born in May; in the South there is another litter in September. They are bare and blind when first born, but the little mother cuddles them under her soft "wings" and takes excellent care of them.

If taken when young, the flying squirrel is a delightful pet. Mr. Ingersoll says, "If you do not know where a family is living, go about tapping on woodpecker-riddled dead stubs on the edge of a wood, until a furry head pops up to investigate, and then the capture is very easy, for it cannot be denied that this little animal seems to be fearless and confiding, largely through lack of wit."

Dr. Merriam gives an account of one which when placed on the table in front of him would come to the edge nearest him and whimper to be taken up; when

the doctor extended his arm the little creature, trembling with delight would leap upon his hand and run up his sleeve or down his neck.

Mr. Ingersoll says that the general testimony of those who have made these animals pets, is that if one chanced to escape from the cage at night it went straight to where its master was sleeping, and crawled into bed with him and cuddled up as close as possible. Several have told me that these squirrels particularly enjoy spending their days curled up in a coat-pocket.

Since flying squirrels are not strictly speaking hibernating animals, they need to provide stores for their winter use. They are not selfish like the red squirrel, but often have their stores in common, in or near their winter nests. These consist of nuts, acorns, corn, grain, birch-catkins, seeds from cones, and various other dried seeds. In the spring they eat many growing buds of trees. In gathering acorns and nuts, they cut off and drop down more than they harvest. Whether this is from mischief or carelessness we do not know. I am sorry to say that they will also take bird's eggs and nestlings, if they can find them.

HOUSE

The flying squirrel should have the freedom of the house. If kept in a cage at all, it should be a large one, like that described for the red and gray squirrels. Mr. Silas Lottridge kept a pair in a large cage, which had a squirrel-wheel attachment, that seemed to give them a great deal of pleasure. One day, in their play, one of them took an apple into the wheel to get it away from the other, and when the wheel began to revolve was vastly entertained by the noise of the

apple bounding against it; and the pair was soon jumping and bounding over the apple as the wheel revolved. After they had learned this game, they often put two or three large nuts in the wheel to make matters exciting.

The ideal home for the flying squirrel is a hole or cranny in a tree trunk near the house; or in a bird box placed on a tree or beneath the eaves. This arrangement gives the little aeronauts a chance to live their lives naturally, and at the same time prove interesting neighbors.

FOOD

The pet should be fed soft-shelled nuts, like acorns and chestnuts, corn, and many kinds of seeds. Mr. Barker found that his flying squirrels were fond of puffed wheat, and oat meal, and almost any kind of breakfast foods. They also learned to eat peanuts. Meal worms, or a bone with a scanty amount of meat on it may be given occasionally. Also bread soaked in sweet milk.

At the New York Zoological Garden, the dietary consists of bread, lettuce, sunflower seed, and a peanut or two once of twice a week.

CARE

Water should not be left in the cage, but a shallow dish that cannot be upset should be put in once a day. Cut hay makes an excellent bedding material for this pet.

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WILD LIFE IN ORCHARD AND FIELD, *Ernest Ingersoll.*

Photo by T. S. Andrus

A WOODCHUCK MOTHER AND LITTLE ONE

From Country Life in America

A PET WOODCHUCK SITTING FOR ITS PICTURE

THE WOODCHUCK

HOW STRANGE it is that country children have so seldom made pets of young woodchucks! They are interesting little animals, and more intelligent than most people think.

The woodchuck shows his cleverness by the way he digs a burrow. He does the work by loosening the earth with his front feet, and pushing it backward and out of the entrance with the hind feet. The direction of the burrow extends downward for a little way, and then rises at an easy angle, so that the inmate may be in no danger of flood. The nest consists of an enlargement at the end of the burrow lined with soft grass, which the animal brings in its capacious cheek pockets. There is usually more than one back door to the woodchuck's burrow, through which he may escape if pressed too closely by enemies. These back doors differ from the entrance in having no earth heaped near them, and in being hidden.

The following true story of a pet woodchuck, was given me by Professor Ida Reveley of Wells College. It is a record of a pet woodchuck, captured and tamed by her and her brother:

CHUCKIE

"Oh, Lou! Open that barrel for me. Just see! I've got the cutest little woodchuck—had him by one toe, and he isn't hurt much, so we will keep him.

Look out; you know they bite like sixty!" With that Bob undid his hat, at the same time holding it over the barrel, and there tumbled out a poor, forlorn, wet woodchuck, scarcely larger than his fist. It was so different in shape from a kitten, that a comparison with a young feline would fail to convey any idea of its true size and shape.

The cover was quickly put over the barrel, and the woodchuck was left to his own reflections on the folly of disregarding parental admonitions in respect to boys and traps. After supper, it occurred to Bob (for a wonder) that his captive might be hungry. He was so small that there was only one way to feed him, so a dish of milk and a spoon were found and the two children set to work, first to get him out of the barrel without injury to themselves; secondly to feed him. The first was accomplished by throwing an old apron into the barrel, and having enveloped the formidable creature in its folds, it was an easy task to tip up the barrel and "dump" the contents upon the floor. Here the apron was removed, and after several soft touches had been bestowed on the animal without resistance on his part, Lou ventured to take him up in her hands. Frightened he may have been, but not so much so that it took away his desire to eat; for as soon as Bob had put some milk into his spoon, Chuckie seized it between his teeth, and placed one paw on each side so he could drain it more easily. A few minutes sufficed to satisfy his hunger for that time, and also to teach him to eat, so that afterwards it was necessary only to place milk where he could find it. At night he was placed in a box behind the kitchen stove, and remained there until early the next morning, when he awoke the household by his shrill little whistle, expressive of his displeasure in having

explored the whole floor without finding anything to eat.

In two or three days Chuckie became accustomed to his home, and grew fat and playful as any sensible creature would have done under like circumstances. He was very fond of running over the carpets, but for some reason or other grandma was decidedly averse to having him walk on the carpet in her room, which was his favorite place for taking exercise. Whenever he saw the door open, he seemed to say, "Now's my chance!" and proceeded to take advantage of it as fast as his stubby little legs would carry him. Grandma usually started at about the same time, and if Chuckie saw that she was getting ahead of him, he would take a shorter route and go under the stove, thus reaching the coveted territory first; after which, with his spunkiness and natural animal obstinacy, it was the work of several minutes to get him out.

He spent much of his time under the stove at first. When he was hungry he would come out and ask for milk as plainly as he could; and if that did not attract attention he would seize the bottom of mamma's or grandma's dress, pulling and grunting with all his might. If they walked along, dragging him, he didn't seem to mind it in the least, but hung on with a perverseness worthy of a better cause.

It was some time before he came to know his name, but he could always be called by rapping on the floor.

Such funny places as he found for a bed when he grew older! Many a time did papa find him curled up in his slipper; and once when Bob had hung his coat on a chair to dry, Chuckie found his way into a pocket; and after that, his favorite place was in the pocket (or sleeve purposely tied at the end) of an old coat which hung on a nail on a low railing.

There was a pile of wood out by the back door, ready to be sawed and put into the woodshed. Under this Chuckie had a nest which he sometimes used in the day time. When the wood pile was removed, this nest was found to be made of bark and all sorts of bright colored things, particularly green paper.

Chuckie was as playful as a kitten, but was by no means as agile, and it was truly a laughable sight to see him play with a piece of bark suspended from the end of a pole.

He was an excellent climber, and liked to be under a dress or coat, and would often climb into Bob's lap and from there under his coat on his back, where he would stay until taken down.

Bob and Lou carried him with them all over the neighborhood, and once even took him to town several miles away. But he grew very troublesome, and they had to borrow a shoe box to carry him home in.

As he grew older he became more shy, and one day he disappeared; only once after that was he seen, and that time in a pasture near the house, when he came within a few feet of Bob, who called him by name.

This is a true story, and Chuckie was only one of the many pets which Bob and Lou had at their home."

HOUSE

It would be better to let the woodchuck play about the grounds and garden, if possible; but if kept confined, the cage should be a large one, eight or ten feet square and three feet high, made of chicken wire, and with cement bottom, otherwise the captive will burrow out. A box at least two feet square, with a

hole in one side large enough for the woodchuck to enter should be provided for a nest, and it should be filled with dried grass.

FOOD

Fresh clover and grass are the woodchuck's favorite food. Melon rinds, sweet apples, peaches, almost any vegetables and roots, especially carrots, will be greedily eaten. Sweet milk may be given occasionally. Fresh water should be kept always accessible.

CARE

The cage should be kept clean, and the grass in the nest box changed often; since the woodchuck is a hibernating animal it should be fed plentifully in the fall, and be given a cold place to stay in the winter. However, it should not be kept in a place where the thermometer drops below freezing. The object of giving food plentifully in August and September is to allow the animal to put on sufficient fat to last during its winter sleep. If kept constantly in a warm place, it will have drowsy spells, but will take food occasionally.

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THE PRAIRIE DOG

THIS little cousin of the squirrels makes a pet that is entertaining the day long, and is also easily cared for, although it does not like to be handled. The prairie dog, sitting up on his mound, with his hands folded, looks like a little statue, so still he sits, when he is making a reconnaissance of the country round about. But this statue soon comes to life, drops on all fours and scuttles off to find a straw, which is the prairie dog's equivalent for a cigar. Then he sits up again, takes an end of the straw in each hand, bends it V-shape, thrusts the angle into his mouth and nibbles away with great enjoyment. He is a jolly fellow, full of fun, and we become very fond of him because of his cheerful disposition.

The prairie dog's whole appearance is attractive, and at the same time comical. His legs are so short, that when he is running along he looks as though he were on casters, and his short black-bordered tail, seems at first to be a mere afterthought; but further observation shows that it is of great use in expressing his feelings, for with every fresh emotion of its owner, the tail jerks sympathetically.

The usual bark of a prairie dog is probably meant for a chuckle, intended to express entire contentment with things in general. However, he makes several other interesting sounds that certainly are full of meaning to his fellows. For instance, he gives a very special kind of a bark when his old enemy, the snake, glides into his burrow; as soon as they hear this warning bark, all of his neighbors gather around, and proceed to fill the hole with earth, packing it

From Country Life in America

PRAIRIE DOG AT THE DOOR OF HIS BURROW

From Country Life in America

A BURROWING OWL AT ENTRANCE OF PRAIRIE DOG'S TUNNEL

hard, thus burying the snake alive. At least this is the story naturalists tell.

The burrow of the prairie dog is very carefully made; around the entrance is a mound of earth packed hard, which in times of flood prevents the waters from flowing into the burrow and drowning out the inmates. This mound also serves as a watch-tower, on which its little builder may sit and look abroad over the land and up into the sky, when watching for snakes, coyotes, foxes, wild cats, hawks and owls, which are the natural enemies of his kind. The burrow extends down a very steep slope from the entrance for twelve or fifteen feet, and then extends out horizontally leading to various chambers, some of which are used for living rooms, other for store-houses, in which harvests of grass or other vegetation may be kept; while there are still other chambers used for refuse.

Mexico and Southwestern United States to the Utah basin, and the great dry plains east of the Rocky Mountains, are the regions inhabited by prairie dogs. They are sociable little fellows, and like to live in villages. Since they soon exhaust the scanty food supply around their burrows, the old villages are abandoned and new ones established in more favorable situations; thus their villages cover acres. Since the development of the arid regions into farming lands, the prairie dogs have taken a new lease of life, and have flourished greatly. They especially enjoy all kinds of farm crops, and consequently do a great deal of damage. Dr. Merriam says that there are colonies extending for a distance of twenty to thirty miles. One colony in Texas covers an area of twenty-five hundred square miles. The government is making experiments as to the best methods of destroying these industrious little burrowers when they encroach upon cultivated lands.

HOUSE

The prairie dog prefers to house himself; so, all we have to do is to give him a little ground of his own, and he will proceed at once to make him a burrow. The difficulty is to keep him from burrowing beyond the boundaries of his chicken-wire fence. If we feed him well, we may perhaps make him sufficiently lazy, so that he will not burrow so extensively under ground. However, if he seems likely to escape, we may build for him a cage, which ought to be at least ten feet square, with a zinc or cement bottom and chicken-wire sides. The floor of the cage should have on it two or three feet of solidly packed earth, so that the little prisoner can play at making a burrow. A most successful enclosure for a prairie dog home may be seen in the New York Zoological Park. It is a circular enclosure, eighty feet in diameter, surrounded by an iron fence, with an overhang, with walls going down to bed-rock. It occupies a rocky hill top, and contains about fifty fat, contented prairie dogs.

FOOD

Almost any green food is acceptable such as grass, clover, lettuce, celery tops, carrots, potatoes, apples, and in fact, almost any kind of vegetation that is green and succulent. In his native home the prairie dog never drinks, and when in confinement he seems to get sufficient water from his juicy green food. A pile of hay or straw should be kept in one corner of the enclosure, to afford the little prisoner entertainment.

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From Country Life in America

A PET PRAIRIE DOG

Courtesy of Doubleday, Page & Co.

WHITE MICE

Photo by Verne Morton

BABY MICE, PINK, BARE AND BLIND

THE WHITE RAT

WE are so accustomed to think of a rat as simply a pest, that we do not realize what the species have lived through in order to survive.

We are quite in the habit of looking to the history of Europe for descriptions of great wars, but there was once a war in Europe that is not mentioned in the accounts of great battles which took place there; and yet, perhaps, this was the fiercest war of all, and it was waged between two species of rats.

Both of these European rat species are supposed to have originated in Asia, probably in China. One of them is the Black rat, more slender than our common species, being about seven inches in length, bluish black in color, and having large thin ears. There is no record of the way or of the time of this rat's invasion of Europe from the Orient; but in 1300 A.D. it was thoroughly established there. In 1727 Europe was invaded by the species called, strangely, the Norway rat; this came from western China, and was a larger, fiercer and more dangerous animal than the Black species. In twenty-five years after it began to invade Russia, it had spread over all Europe, and had conquered, killed, and probably eaten the Black rats, which had been in possession of the region for so many centuries.

A similar warfare took place in America, for probably with the ships of Columbus, and certainly in the *Mayflower*, the Black rats migrated from

Europe to America. Soon after the Norway rat had conquered Europe it came to America in ships, and here has carried on the war of extermination against the Black species, which is now found only in remote corners of our country. There is a variety of the Black species which has escaped this general extinction. It is found in Egypt and adjoining countries, and has been introduced into our Southern States, it is called the "Roof rat".

White rats and mice have been known for a long time; they are the albinos of our common forms, but have been bred for so long as fancy pets, that the breed is distinct. They are far more delicate than their common relations, but are more easily kept.

HOUSE

The general management for a white rat is the same as for mice, only the rat needs a larger cage. A pair of rats should have a cage at least two feet long by one foot wide and high. The front of the box should be covered with one-half inch wire netting; the cage should be bedded with sawdust or dry leaves, which should be frequently renewed. Every week or two the rats should be removed into a fresh house, and the one they have been in should be washed with soap and hot water and thoroughly dried before they are again put into it. In a corner of the cage there should be a sleeping compartment made of an inverted box, with a hole at one side, large enough to admit the body of the rat. This box should be filled with strips of paper or excelsior.

FOOD

The white rat may be fed grain of all kinds, and insects; it is especially fond of meal worms, hard-

boiled egg, and now and then a bone with some raw meat upon it. In fact, almost any table scraps are acceptable to these creatures, but they should never be fed with cheese. Plenty of fresh water should be kept in a dish where the rats can have constant access to it.

Into the street the Piper stept,
Smiling first a little smile,
As if he knew what magic slept
In his quiet pipe the while;
Then, like a musical adept,
To blow the pipe his lips he wrinkled,
And green and blue his sharp eyes twinkled
Like a candle-flame where salt is sprinkled;
And ere three shrill notes the pipe uttered,
You heard as if an army muttered;
And the mutterings grew to a grumbling;
And the grumbling grew to a mighty rumbling;
And out of the house the rats came tumbling.
Great rats, small rats, lean rats, brawny rats,
Brown rats, black rats, gray rats, tawny rats,
Grave old plodders, gay young friskers,
Fathers, mothers, uncles, cousins,
Cocking tails and pricking whiskers,
Families by tens and dozens,
Brothers, sisters, husbands, wives—
Followed the Piper for their lives.
From street to street he piped advancing,
And step by step they followed dancing,
Until they came to the river Weser
Wherein all plunged and perished.

From "The Pied Piper of Hamelin" by *Robert Browning.*

MICE

WHEN properly cared for, the ordinary house mouse makes an amusing pet; but the little white-footed mouse of the woods is, on the whole, more interesting and agreeable. The house mouse is wonderfully adapted for a successful life. The thin, velvety ears are wide open for catching any sound; the eyes are keen, and the nose is long and inquisitive, and always sniffing for new impressions. The whiskers are delicate and very sensitive. The gnawing teeth are very strong, enabling the mouse to gnaw through boards. At the first glance one wonders why the mouse should have such a long and scaly tail; if we watch our pet we will find that it uses its tail in climbing up the sides of its cage, and will also twist it around its little twine trapeze when hanging to it with its hind feet.

It is particularly interesting to watch a mouse clean itself. It nibbles and licks its fur, reaching around so as to get at it from behind, and taking hold with its little hands to hold it firm while being cleaned. When washing its face and head, it uses its front feet for a washcloth, and licks them clean each time after rubbing from behind the ears down over the face.

Young mice are small, downy, pink, and are born blind. The mother makes for them a nice soft nest of bits of cloth, paper, grass, or whatever is at hand. The nest is ball-shaped, and at its center the family is cuddled.

Of all the wild mice, the white-footed or the deer mouse makes the most interesting pet. It lives in the woods, and is very different in appearance from the house mouse. Its ears are very large, and it is white beneath the head and body. The feet are pinkish. This mouse stores food for winter use. When I was a child I found in a hollow log two quarts of shelled beechnuts stored by this mouse. This little creature has a pretty habit of making its summer home in the fork of a branch or in a deserted bird's nest, which it roofs over. The young mice are carried hanging to the mother's breast.

HOUSE

While there are many good cages for observing wild mice, the one I like the best is an aquarium jar, with straight sides, either square or circular; a cover of wire netting is necessary. Place in the jar plenty of paper in strips, or excelsior, so that the pet may hide beneath it. Fasten a coarse piece of twine so that it will extend from the middle of the cover nearly to the bottom of the jar, so that the mouse can amuse itself, and us, by climbing. There should be another jar of the same size to which the mouse may be changed when its nest needs cleaning, which is as often as once or twice a week. It is rather difficult to change the mice from one jar to the other, and it should be done thus: Take off the cover and invert the clean jar to take its place, then turn both jars on their sides on the table, mouth to mouth. Wait until the pet is exploring his new quarters, then thrust a square of wire netting in for a cover and bring the fresh jar to an upright position.

FOOD

Mice thrive on almost all that we eat, and are especially fond of breakfast foods. They like stale bread, flies, meal worms, and bits of raw meat or hard boiled eggs. There must always be a dish of water in the cage; if there is not plenty of water, mice will destroy each other. They should never be given cheese.

CARE

Mice need to be kept in a moderately warm room, and must always have plenty of soft material for their nests. The cage must be cleaned and scalded at least once or twice a week.

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"The Tunnel Runners," NEIGHBORS UNKNOWN, and "In the Deep of the Grass," in THE WATCHERS OF THE TRAILS, *C. G. D. Roberts.*

THE MOUSE'S PETITION

Found in a trap where he had been confined all night

Oh! hear a pensive prisoner's prayer, for liberty that sighs;
And never let thine heart be shut against the wretch's cries.
For here forlorn and sad I sit, within the wiry grate;
And tremble at the approaching morn, which brings impending fate.
If e'er thy breast with freedom glow'd, and spurn'd a tyrant's chain,
Let not thy strong oppressive force a free-born Mouse detain.

by *Anna Letitia Barbauld.*

FANCY MICE

It is difficult to believe that the Golden, Brown, and Black and Spotted fancy mice were really descended from our little gray house mouse, but this is a fact which has been discovered by scientists. It seems that the hairs in the fur of the house mouse contains black, chocolate and yellow pigments, arranged so that the base of the hair is black, the tip is yellow, while between it is barred with chocolate brown. Mice are likely to give birth now and then to pink-eyed, pure-white albino offspring; these have been selected and bred until a race of albinos has been established, and thus we get our white mice as pets. By breeding these albinos with the house mice the colors in the coat of the latter have been separated, and some disappear altogether, and thus our fancy mice have been developed.

The Golden Agouti has the same arrangement of pigment in the hairs as the house mouse, except that the yellow tips have been exaggerated so that this mouse is golden in color. The Sable is like the Agouti, except that its back is dark, and it is golden yellow underneath and at the sides. The Cinnamon has only the yellow and the chocolate pigments in the hair, the black being left out, while the Black has chocolate and black pigments, but no yellow, and the Fawn has yellow and black with the brown left out.

The Red and Yellow varieties carry only the yellow pigment. The Chocolate carries only the brown

pigment. In the following varieties these colors have become pale and diluted: Blue and Lilac have a diluted black pigment; the Silver has a diluted chocolate pigment, and the Cream has the yellow pigment diluted.

The varieties mentioned above are solid colored, but there are also several varieties that carry several colors. The most noted of these are the Dutch marked, which have the eye-patches, ears and rear portion of the body in some solid color, the remainder of the body white; these are very pretty when the colors are black and white. Beside these there are the spotted varieties in all colors.

HOUSE

There are many varieties of cages for pet mice. Any box with a lid, and that has a floor area of twelve inches by six inches will do for a pair. One side of the box may have a wire screen or a glass, so that the pets may be observed. These cages often have a slit along the lower edge of one side which may be used in cleaning out the cage; a little scraper with a handle may be pushed through this slit for drawing out the soiled sawdust; of course such an opening must be closed by a strip of wood when not in use.

Each cage should always be furnished with a movable nest box, this should be at least four inches square, with a hole in one side two inches in diameter, and should have a lid for convenience in cleaning which may be hooked down with wire while in use. This nest box may be attached to the side of the cage, or placed in one corner on the floor. However, it should be where it may be easily reached by the hand from above when the lid to the cage is raised, for the

mice are less likely to escape through an opening above than through a door at the side.

CARE

Mice are born naked, blind and deaf, and are most helpless little creatures; they mature in four months. When four weeks old the males and females should be separated and kept in separate cages. The females will live together usually without fighting, but the males fight to the death if kept together after they are mature. As soon as they begin to fight, they should be separated and put in different cages.

Before she gives birth to her young the mother mouse should be put in a separate cage containing a nesting box eight inches square. The very young mice should never be handled nor the nest be disturbed for at least eight days after their birth, else the mother may destroy them. She sometimes destroys them because of thirst, so she must be kept well supplied with fresh water. It is well to give her bread soaked in water every morning after the young are born.

FOOD

Food of the simplest kind is best for fancy mice. Canary seeds, white millet and oats, a piece of stale bread or good dog biscuit soaked in skim milk, a morsel of apple or carrot in winter and grass heads or dandelion leaves in summer.

If the mice are fed twice daily, give the cereals at night and the soft food in the morning. Sugar and salt are both apt to disagree with mice and a large amount of animal food makes them smelly.

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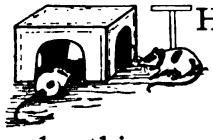
FANCY MICE, *C. J. Davies*, published by L. Upcott Gill, London.

JAPANESE WALTZING MICE



THESE brown and white, piebald dancers are a source of amusement to all who watch them. Anatomists and physiologists have written long treatises upon why this mouse dances like a spinning top. But it does not matter much to us whether the dancing is caused by imperfect equilibrium through some defect of the ear or brain, or from some other cause, so long as our pets keep active and entertaining. It is supposed that these mice originated in India, from the common mouse of China and were introduced into Japan. There is a pretty legend that these mice lived in the cotton bolls of India in the long ago.

Mrs. Cyrus R. Crosby has given to me the notes which she made upon the habits and care of her pair of pet waltzers. Although they are nocturnal in their habits, and begin their regular dancing after four o'clock in the afternoon, yet she found that sometimes they came out in the morning or at noon and danced for a time. Once she tried to count how many times one of them whirled without stopping; the approximate number was two-hundred and seventy-four. One day when taking the male out of the cage he bit his mistress, and in the scramble that ensued he jumped into the drinking dish as he returned to the cage. He was greatly disturbed and excited over getting wet; for a time he danced faster than usual, then sat down and began to clean himself most violently; he scraped the water off his fur with his foot, and then licked his foot; he used both fore feet and hind feet for this process until he looked

very sleek. He was oblivious of everything else while cleaning himself, not paying the slightest attention to the fact that his mate in dancing was constantly switching his face with her tail. Later, the pair quarreled, and the female turned into a vixen, attacking her frightened spouse on all possible occasions, and driving him into the corners in a most heartless way.

HOUSE

Since these mice are very sensitive to drafts, their cage should be a wooden box with wire netting over one side. Mrs. Crosby has a circular cage of wire netting which has the advantage of giving a better view of the dancers, but she has to be very careful to keep the cage away from drafts. The floor should be covered with dry sand or sawdust. It is convenient to put several layers of paper on the bottom of the cage, removing the soiled top one each day. The mice should be removed and the cage washed with an emulsion of kerosene and water once a week, drying it thoroughly before putting the mice back into it. In one corner of the cage there should be a retiring nest; a wooden box two or three inches square with a hole in one side will do. This should be placed on the floor and not fastened up against the side of the cage as with fancy mice. Shredded tissue paper makes the best bedding for these delicate creatures. Cotton or other fibrous material is not suitable.

A playhouse should be placed in the cage. This is made by taking a wooden box, without a cover, about three inches square, and two inches high. Cut holes one and a half inches wide down the sides of the box opposite each other. Invert this box in the

middle of the cage, and the weird little creatures will play in and out through the openings by the hour.

FOOD

Dry food should be given chiefly, such as canary seed, hemp seed, dry bread, crackers, force, or other cereals. Give for a change bread soaked in sweet milk. Every other day give a bit of lettuce or turnip or carrot.

Fresh water should be put in the cage every day, for these mice are thirsty little creatures, and need pure water to keep them healthy.

CARE

The cage should be set where there are no drafts, and the temperature should not vary greatly from 60°. In general the care is very similar to that given to fancy mice.

WALTZING MICE

Little four-foot dervishes are they
As they whirl and twirl—
It is not work and it is not play—
'Tis as if they just were built that way
To twirl and whirl.

They go so fast they make a blur
As they whirl and twirl,
Their very long tails and spotted fur
Look like a wheel on a pivot awhirr
As they twirl and whirl.

From Country Life in America

A WHITE-FOOTED MOUSE AT HER OWN DOORWAY

From Country Life in America

TAKE CARE!

A mother opossum defending her young

THE OPOSSUM

HE only way we can understand why the opossum developed a pouch in which to hide and carry her young, is to think of the enemies the ancient opossum families had to meet; for the opossums appeared first during the Mesozoic period, the age of terrible reptiles. At that time there were various species of opossums scattered over all Europe and North America. Whether the reptiles ate them, pouches and all, and so destroyed them, we shall never know; but now the opossums have disappeared from all countries except South and Central America, and one species in the Southern United States; and this species is certainly having a hard struggle for existence because it is preyed upon by most wild animals that eat meat, and by one tame one, that eats a great deal of meat, i. e., man. Mr. Sharp says of our opossum that "He is an eternal surprise. Either he is the most stupidly wise animal of the woods, or the most wisely stupid. He is a puzzle. Apparently his one unburied talent is heaviness. Job, the fat boy, was not a sounder, nor more constant sleeper, nor was his mental machinery any slower than the 'possum's. The little beast is utterly wanting in swiftness and weapons, his sole hope and defense being luck and indifference."

The opossum builds its nest in hollow logs or stumps, or in hollows about the roots of trees. It

usually rents its house ready-made, not taking the trouble to dig it out, but makes a warm nest for itself when cold weather threatens, by carrying in dried grass and leaves rolled into bundles so as to be carried by the useful tail. It does not sleep all winter, but comes out often to visit hen-roosts, and even kitchens trying to find something to eat.

The opossum has a most interesting form. Its tail is scaly, and acts as a third hand when the creature is climbing, since it can be twined around a branch and will hold the weight of the animal, which is thus enabled to swing from one tree to another. Its feet look very much like hands, and are made for grappling; but the most interesting thing about the opossum is the pocket in which the mother carries her babies, which are born blind and naked, when not more than an inch long. With her teeth the little mother places each helpless mite in her pocket, where it clings to a teat; and here safe in the pouch the babies stay for about two months while they grow very rapidly. After a little they climb out and clamber around on the mother's back and anchor themselves by twisting their own tails about that of their parent; but they rush back into the pouch when there are signs of danger.

"Playing 'possum" is a common saying, and it refers to this creature's habit of acting as if it were dead when overcome by the enemy. It acts this part so well that it may be maltreated severely but will not give a sign to show that it is alive. But if it sees the enemy off guard for a moment it comes to life and disappears very suddenly.

The young opossum makes an interesting pet. It is sharp-witted and knowing, and is very fond of play. However, it does not become attached to

From Country Life in America

PLAYING POSSUM!

people, even to those who feed it. It uses its teeth too freely for comfort sometimes, and is rather given to chewing up slippers and handkerchiefs and other articles of apparel.

HOUSE

It is best, if possible, to let the pet opossum run about freely, but it must not be forgotten that it is naturally a night prowler, and therefore should be confined at night. It may have its nest in a barrel or box in the house. It usually sleeps during the day. It is never to be placed near the chickens or other domestic fowls. If confined all the time to a cage, there should be in it branches for the pet to climb, for it is naturally a dweller in trees.

FOOD

The opossum is a general feeder, and in a wild state eats insects, young reptiles, mice, birds and birds' eggs and fruits. It may be fed corn, nuts, berries, persimmons and other fruits. It is also fond of bacon, dried beef, or any bits of meat and poultry. It should always have access to plenty of fresh water, and its cage or nest should be kept clean.

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"In Persimmon Time," WILD LIFE NEAR HOME, *D. L. Sharp.*

And I saw a mother possum up in a tree,
Her tail was arched above conveniently,
And hanging to it by their tails were three
Little baby possums as cute as they could be.

THE LITTLE BROWN BAT

WHEN a bat is first captured, it is so excited and snappy that courage is required to handle it for it can inflict quite severe wounds. But it readily responds to kind treatment and soon learns to take food from the hand of its master or mistress.

The bat has perhaps the most wonderful wings of all winged creatures, for they consist of a thin membrane spread over the fingers to the arms and back along the sides to the hind legs, and from the hind legs to the tail. This membrane is filled with sensitive nerves, which informs the swift flyer of the objects in its path, so that it is able to dart among the branches of trees in the night at terrific speed, never touching a twig. Its flight is the highest ideal we may entertain for the achievement of the aeroplane. The bat as it darts about keeps its mouth open, and scoops in all the insects that it overtakes. During the winter, bats hibernate, like the woodchucks. They select for the winter some hollow tree or protected place, there they hang themselves up by the front feet or hind feet, and go to sleep and do not awake until the insects begin flying the next spring.

The little bats are born in July, and usually occur as twins. The mother feeds her little ones from her breast, cradling them in her soft wings for the time. Sometimes she takes them with her when she goes out after insects in the evenings, and they cling securely to her neck while she darts about. When

Photo by Verne Morton

THE LITTLE BROWN BAT

Courtesy of Doubleday, Page & Co.

A BAT ASLEEP

she wishes to hunt more easily, she hangs her little youngsters upon some twig, and they are sufficiently well-trained to stay there until she returns to get them.

Bats should be handled with care, since they are able to give a very sharp nip with their needle-like teeth. They may be caught in an insect net and gradually tamed. The following account of her experience with a bat by Miss Evelyn Groesbeck Mitchell, will suggest the proper treatment for this pet:

My first bat came to me in the following manner. One day a small, excited, red-headed boy rushed up to me with a pasteboard box, from which came a great hissing, scratching and squeaking, a sharp, penetrating, painfully high, metallic squeaking that set my ears aching.

"What is it, Michael?" I asked.

" 'Tis a quare mouse I found in me cellar," said Michael, "I know ye loike mice. Luk at him."

Carefully I slid off the cover, holding the box beneath a large glass jar. Out bustled a highly indignant little Brown Bat, hissing like a boiled-over kettle and scrambling about in a ludicrous fashion on his outstretched wings and tiny feet.

I took the little beastie home and put him in a glass-sided box with wire top. He at once hung himself up-side-down from the wire by the hooked claws of his hind feet and vented his wrath in a series of shrill squeaks, which he kept up all night.

On my venturing to peep at him next day it seemed as if he would literally burst with rage. Offers of food, in the shape of flies at the end of a long straw, were snappishly rejected. For a whole day the obstinate little rascal starved himself. About six

o'clock and in the middle of what was evidently intended for a lively scolding, I popped a fly into his wide open mouth. Snap went the jaws and down went the fly into the hungry little stomach. The next fly took the same trip down the 'red lane' and the third was eagerly seized. After that the scamp stopped scolding. It kept us busy hunting flies for him. In fact, as it was late in the fall, flies were hard to find and raw meat had to be substituted. This he would chew in a most impolite way, opening his square little mouth to its full extent at every bite. He soon snatched food eagerly from my fingers and would cling to my hand while eating.

On being offered water in a doll's spoon he dipped his nose in, sputtered, sneezed, chattered and finally drank. For milk, however, he showed great preference, lapping greedily with his tiny red tongue.

In two days my strange pet was perfectly tame. I let him out in my room. He immediately hung himself on a bunch of seaweed in a corner of the ceiling, remaining there all day. This was always his favorite place. At dusk he would fly about the room and I have seen him catch flies. When the lights were on I put him in the box in spite of his scolding.

Very soon he learned to know me, because I fed him. He would hitch himself to my dress or snuggle in my palm like a bunch of floss silk. Strangers he did not like, and a great many actually did not know what he was and were afraid of him. His sensitive wings he would not permit me to touch at first, later he did not care so long as I was very gentle. He delighted in being scratched on the back very gently with a bit of wood. He washed himself with his tongue and rubbed his face with his wrists. When

he was hanging up he could reach almost all over himself and he looked very funny when he washed his back.

When my little fellow was hungry, he would fly in my face or scramble about my dress, making faces and saying in sharp bat words, "I want something to eat." If I were not quick about it, I was as likely to be bitten as the meat. Luckily his bites were not as big as his temper or there would have been nothing left of me. He was not particular as to when he ate, and often flew by daylight, that is, in the afternoon.

Do you know that bats, like many other animals, sleep all winter? But my little bat did not sleep except on the coldest days—the room was too warm.

When spring came and the other bats began to fly, he would hang on the window screen in the evening and squeak. I suppose he was singing. Pretty soon another bat lit in a tree outside the window. Then there was a duet. It proved too much for my nerves. I threw all sorts of things at that bat in the tree, but he or she simply shifted about and kept up the cricket-like song. After three nights of ear-racking serenade, and the protest of the rest of the family, I liberated my pet. I think it was he who hung on my screen and flew about with another bat for several nights, but at last I saw him no more.

HOUSE

The above story suggests that the bat should be kept in a room so that it may fly about, otherwise I am sure it will not live very long. I had a pet bat for some weeks, and I kept it in a dark box during the day, and let it fly around the room at night.

FOOD

Almost any kind of insects are in the bat's dietary, but bits of raw meat may be substituted. Fresh water must be placed where the little creature can find it, and I found my bat also was very fond of drinking fresh milk.

CARE

The chief care is to provide the bat a place to hang during the day. A loose curtain affords an excellent surface for it to cling to, or twigs or slats may be used. It is best to keep the bat in a cold, but protected place during the winter, so that it can follow its natural habit of hibernating.

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THE BAT

"As blind as a bat," the foolish say,
Which shows how much they know.
I can see by night, I can see by day
I have wonderful wings that feel my way
In the dark where branches grow.

I dart about in the twilight gray
Catching insects, which are my prey
With my mouth wide open so!
And when I am tired without delay
I hang upside down wherever I may
And fast asleep I go.

From Country Life in America

JUST AFTER A NAP

A Raccoon in a Tree

Courtesy of Doubleday, Page & Co.

FEEDING A BABY COON FROM A BOTTLE

THE RACCOON

NO ONE has yet settled the question whether the crow, the fox, or the raccoon makes the most mischievous pet. Each does its best to earn the medal in this competition; but of the three, the raccoon certainly looks the most mischievous. The black patches around his eyes look like goggles; and there is a deep, speculative look in the eye itself, that matches the anxious look of the face. Probably his anxiety is occasioned from fear that he has not done all the naughty tricks possible in a given time. The raccoon is always full of curiosity, and will examine any unusual object with great thoroughness. This meddling habit has often led to his undoing; for one way of trapping coons is to suspend above a trap a bit of bright tin; this so fixes the attention of these wily animals that they lose all caution and walk into the trap.

The wild raccoon likes to live near water, because of its partiality for frogs, fish, oysters and other water animals. It also has a strange habit of washing its meat before eating. Thus it is, we often find raccoon tracks in the soft mud on the margins of pond or stream; these tracks are unmistakable, for the raccoon is what the scientists call a plantigrade, i. e., it walks on its entire foot instead of its toes, and its tracks look as if they were made by the hand or foot of a fairy.

Raccoons usually have their nests in hollow trees, or in caverns in rocky ledges. They are night wanderers, and sleep daytimes, curled up in the forks of branches. It is a comical sight when a coon thus arranges itself for a nap; it adapts its fat body to this uneven narrow bed with perfect ease, and tucks its nose down beneath its paws, and curls its tail about its body, thus making itself into a furry ball. The black and gray ringed tail protects its owner from sight because its colors seem like flecks of sunshine and shadow amid the foliage of the tree.

During the summer the raccoon lays on enough fat to sustain it during the winter. Usually several lie together in their winter nest, sleeping away the hungry cold months. When they come forth during the thaws of March or April to hunt for what scant food they may find, they are lean and weak.

The young are born in April and May, usually from three to six in a litter; they are blind and helpless at first, and are cared for tenderly by their parents. The family usually remains together for a year, when the youngsters are fully grown. The young cry pitifully when separated from their parents. In fact, the coon's cry is never a cheerful sound; it is a strange, sad wail, ending in a whimper.

The raccoon is a very general feeder, and is fond of corn in the milk stage, and thus does much damage. It is also fond of poultry, and destroys birds' nests. It is fond of fish, and catches them in its paws while sitting on the shore. It eats frogs, turtle eggs, snakes, and on the Gulf coast feeds largely upon oysters. It also relishes fruit, especially berries and wild grapes.

As a pet, the raccoon soon learns to do a great many things which we would rather it did not learn.

We once knew one that ranged over the house to suit his fancy, and he learned to open the door of every cupboard in the kitchen and pantry. He also opened boxes with perfect ease. Another was chained in the yard, and would lie curled up as if asleep, with one eye always slyly watching the food left from his breakfast. Soon some unwary hen would come up, stretch her neck cautiously until, reassured, she began the stolen feast. Then there was a scramble and a squawk, and before we could save her he would have wrung her neck and stripped off her feathers.

HOUSE

To really enjoy the pet raccoon, we should let him have the run of the house. He soon becomes very much at home, and never attempts to run away. A basket or a box can be put in a certain corner for his sleeping quarters. If he is not wanted in the house, a dog's kennel, or a barrel or box may be given him for a home; to this he may be chained, and should have a nearby branch on which he can climb. The roomier the place the better for the raccoon, for he loves his freedom. An enclosure of chicken wire, with a shelter shed in one corner, and a tree or branches on which he can climb, is a most desirable coon cage.

FOOD

Water is so necessary to the raccoon's happiness that is should be spoken of before food. He is particularly fond of pieces of raw meat which he will souse around in his drinking basin until it is pallid and flabby, and then he will eat it, using his paws like hands to aid his teeth in tearing it apart. He is fond of beetles, mice, rats, insects, fruit, corn, molasses,

sugar, preserves and cake. He will eat eagerly almost any of the food scraps from the family table.

CARE

The raccoon should have fresh water to play in constantly. If we think he needs a bath we can give him one in warm water and he will like it. The mother coon, when her young are born, must have a good supply of water, for she will destroy them if she cannot have water with which to wash them.

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WILD NEIGHBORS, *Ernest Ingersoll.*
"Mux," ROOF AND MEADOW, *D. L. Sharp.*

Oh Mister Coon with goggles black
You surely do look wise.
But in the mud your little track
Is fairy-footed size.

Your tail is ringed with black and gray
You never are in haste.
You wash your meat in a funny way
Before it suits your taste.

THE PORCUPINE

THERE are some of her creatures that Mother Nature has clad in armor, notably the turtle, the armadillo and the oyster; but the porcupine has an armor of defense, which is made up of weapons of offense, consisting of bristling spears; and each of these spears, is, near the tip, beset with backward curving barbs, so that when it is once imbedded in flesh, it works farther in at every movement. The pain the hedgehog's quills inflict is severe, and many an animal has died from these imbedded spears.

When attacked, the porcupine curls up so as to protect its nose and the under part of its body; meanwhile, it lashes the enemy in the face with its short club-like tail, and leaves a mass of quills with every stroke. Old hunters tell us that the best way to extract quills from the flesh is by twisting them around; "screw them out", instead of extracting them by a straight pull.

The porcupine is not a very intelligent animal, and therefore its chief interest as a pet lies in watching its queer habits. It has been protected from its enemies so long and so well, that it is not afraid of anything. Because its quills are so sharp, its wits have not needed to be sharpened in order to avoid danger.

The natural home of the porcupine is a nest of dry leaves in a hollow log, or beneath a pile of rocks. It

spends much of its time in trees, sometimes climbing about in one tree several days, eating the buds and bark. Its food is succulent bark, foliage, twigs, buds of trees, and some nuts, such as beech-nuts. It is especially fond of salt, as campers in the forests have learned to their sorrow. It attacks the camp stores in order to get at the bacon, and it particularly enjoys gnawing the wood of an old salt barrel. It is also fond of sugar, and often damages the utensils used in maple sugar making. Its teeth are long, sharp and yellow, and especially fitted for gnawing. In fact, this little animal must have something hard to gnaw, in order to keep its teeth worn down; otherwise, they would become so long as to prevent the mouth from shutting, and inflict starvation.

HOUSE

It should be remembered that the porcupine is active nights and sleeps during the day. It also hibernates in the winter. The young are born about the first of May; there are usually two, rarely three, in a litter. The young porcupine is a huge baby, it is larger than a newly-born bear-cub; its eyes are open, and its body is covered with soft, furry, dark-brown hair. Out through this dense fur grow long hairs tipped with yellowish white, these harden and become quills. The mother is very careful of her young until their quills are grown, then she weans them.

A porcupine as a pet should not be kept indoors, for it is a smelly animal, and often infested with fleas. It should be kept in a hutch, bedded with sawdust, which will need to be renewed frequently. There should be a retiring box in one corner of the hutch, bedded with dry leaves.

FOOD

As a pet, the porcupine eats apples, vegetables, bread and milk, chopped cooked meat, and almost any table scraps; and it should always be provided with fresh water.

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MISTER PORKY

Mister Porky, you are like a chestnut bur
  Trotting round on pitty-pat-y feet.
But hidden in the chestnut's prickly fur
  Is something very good, indeed, to eat.

Mister Porky, to discover I have tried
  What good there is so hid beneath your quills;
Have you a temper sweet and satisfied?
  Have you a heart that joy and gladness thrills?

Mister Porky, you are not so very big,
  Nor half so fierce as your appearance warns.
You are nothing but a little piggy-wig
  All covered up with very thornful thorns.

FERRETS

THE one who handles ferrets needs to have courage; for however carefully the little master or mistress may be, they are sure to be bitten more or less. Ferrets are never so tame that they will not bite at the smell of blood. The ferret has an almost uncanny fierceness, and a will power that makes it a destroyer of other animals. This characteristic fierceness is not likely to teach gentleness to its caretakers; but other pets may be kept for that purpose; and with all the knowledge which we now possess concerning the dangers to human life through rats, we must realize that sympathy with the lower animals cannot always be maintained. Thus it is that ferrets may well supplement the child's experience with pets; if he has eyes to see, the ferrets will give him some excellent examples scarcely to be gotten elsewhere, of some of the forces in the great struggle for existence in nature. Moreover, one who watches a ferret mother care for and discipline her young ones gains a new insight into the training which the wild mothers administer in fitting their youngsters for successful lives.

I am indebted to Mr. Karl P. Schmidt for my interest in ferrets. At my request his brother, Frank J. W. Schmidt, a lad of twelve years, wrote me a letter about the habits of his ferrets, and I think I cannot do better than to give the letter exactly as he wrote it:

MY EXPERIENCE WITH FERRETS

A year ago my father brought me a pair of ferrets. They were then about eight months old, and they proved to be the most interesting pets I have ever had. We got them because we were overrun with rats, and wanted to try them for rat hunting. They are relatives of the English polecat and of the American mink and weasel, and are much like them in their habits, they will not hunt or kill their cousins. Female ferrets are called "Jills", so we called our two Jack and Jill. My big brother made a box or hutch four feet long, two feet wide and two feet high with half-inch mesh wire on part of the side and on a large door on top. At first we had a box in the back for them to sleep in, but later we found that they ought to have a dark room, so we put in a partition about fifteen inches from the end with a two inch hole for a door. We put in hay or straw for their bedroom, and coarse sawdust in the front room. They are very neat and clean in their habits, using only one corner of their hutch for a toilet room; but of course they have the strong odor of all their family. It is better to paint the floor and at least six inches of the wall of the hutch, as it is thus easier to clean. The hutches and dishes have to be kept very clean, especially in hot weather. If kept clean the ferrets are never sick except that sometimes the young ones get a kind of distemper, that is nearly always fatal.

The first winter we kept them in the house and after they got used to us and a little tame, we let them run in a big sitting-room. They had lots of fun exploring it. They do not seem to see much, but smell everything. They liked to hide behind papa's big desk, and would crawl into the fireplace wood-box, and into ma's stocking basket for a nap. If

there was a wrinkle in the rug it made a fine tunnel for them. We used to put a stocking on the floor for them to go into; they could go clear to the end and turn round and come out head first—one would scarcely believe what a small hole they can turn around in. If we play with them they dance around in a comical way—backwards or sidewise, always keeping an eye on us. If they find something on the floor new to them, a broom, a mop, or ma's sewing, they just go crazy, roll over and over on it, get under it, pull it with their teeth and very likely nip you if you try to take it away from them. We had a playful little cat (we first called it "Little Cat," then L. C., which was finally corrupted to Elsie), and Jack would play with her, but he always finished by nipping her on the ear; he never bit her anywhere else.

No matter how tame they are they have to be handled carefully or they will nip or even bite hard, if they get a taste or smell of blood. Once one bit my finger and I made him let go by pinching his tail; but another time I held Jack too close to my face and I must have had a little blood on my nose, for he made a grab for it, and wouldn't let go—we had to slip the separator wrench down his throat and twist it around to open his jaws. After that I was more careful. When hunting rats we always handled the ferrets with gloves.

They were not trained when we got them, and when we put a rat in their hutch they did not know what to do with it; they would nip it a little, but the rat was more than a match for them. So we trained them by giving them live mice and English sparrows, and they soon learned to kill things with one bite. Then we tried putting in the rat again. It

was as big as Jill and they had a royal battle, but Jill came out ahead. Once I put her into a hole in the wall of the hotbed and three rats ran for their lives. I got one with my shinny stick. Another time I put her into the wall of the barn, and she found a rat's nest, chased the old rat out, ate up the young ones, and curled up and went to sleep in the nest. When I got tired of waiting for her to come out I cut a hole in the wall where I had heard her last, and there she was. Once I took her out in the field and put her down a gopher hole. The gopher did not have her safety hole dug, so Jill caught her by a hind leg and backed out. She had to work hard but she got her out. She was a surprised gopher. Ferrets are always ready to go into any kind of a hole to investigate.

I never saw any animal sleep so soundly as a ferret. The first time we found Jill asleep we thought she was dead; she was perfectly limp, and Karl called us in to view the remains; but by the time we all got there she woke up, stretched, and seemed to ask us what the trouble was, anyway.

Ferrets are easy to feed—a little bread and milk twice a day, with johnnycake, oatmeal, or pancakes for a change, and meat when convenient. We gave them the mice and rats and red squirrels that we caught, and some of ma's weak chicks. In the spring we had a few small chicks in the house and no matter where we put them, Jack hunted them out, and they soon disappeared. We were more careful after that. They always take hold of a chicken or sparrow just back of a wing, and seem to kill them instantly. Rats and mice they bite just back of the ear.

In April we put Jack in a separate hutch, and in May we heard a curious squeaking in Jill's sleeping

quarters, and knew she had young ones. The ferret book says the mother will kill the young ones if you look at them before she brings them out herself, but after awhile I could not wait any longer and peeked through a crack in the partition. There were eight young ones, seven like Jack and Jill, (the brown ferrets are called polecat ferrets), and one pure white. When they were about four weeks old, Jill began to carry in bread for them. She would line them up and give each one a piece, and when she thought they had eaten enough, she took it away and put them back in the nest. Often they wanted more bread, or wanted to run around a while, but she made them mind. She carried them by the back of the neck, and if they cried, she cuffed them. After they began to come out for their own food she was still busier, for she kept strict watch, and made them stop eating when she thought they had enough. When they outgrew the hutch, we moved them to the kitchen of an empty cottage, and gave them an empty cracker box to sleep in.

The young ones grew very fast, and were as big as their mother in three months, and even larger by fall. They were most interesting to watch while we had them in this kitchen. There was a pantry in one corner with good hiding places in it, and the young ones always wanted to take their food in there, while Jill wanted the food in the sleeping box. They were trained from the first on rats and made short work of the ones we gave them; they would sink their teeth in a rat and try to get it in the pantry, but Jill would haul the whole lot of them into the cracker box, just by will power, for they were eight to one. If one of the young ones got more than his share, Jill would hunt him up, and then come back and

bring the rest of them to him. They killed mice and chicks (the stunted ones) so quickly that it really was not cruel to give them their meat alive. I spent a good deal of my time during the summer at the window of the ferret cottage, watching their ways of playing. They were the greatest wrestlers you ever saw, sometimes they would play in twos, sometimes in threes, sometimes the whole lot would have a free-for-all—I had to laugh and laugh. Their noises and calls are very interesting—they have a regular ferret language.

During the hot weather I lost two from distemper, I think, because I left some sour milk where they could get at it. The others I raised and sold at the age of five months, at $3 a pair. They are easy to tend and I think any boy that is not too much afraid of being bitten, could raise them. I would rather lose any other pets than my ferrets.

F. W. SCHMIDT.

Fernwold, Dec. 18, 1913.

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A LITTLE DETECTIVE

The Ferret has an active nose,
His whiskers match his snout;
He's a detective, sharp, who knows
Just how to ferret out
What may be hid by friends or foes.
He's a Conan Doyle, no doubt!

THE SKUNK

THERE is certainly no one but a naturalist would have thought of making a pet of these malodorous little animals, but Dr. Hart C. Merriam, one of our greatest living naturalists, once lived near the Adirondack mountains. While there, he tamed young skunks, and declares them to be cleanly and charming pets. He says:

"From some I removed the scent bags, but the greater number were left in the state of nature. None ever emitted any odor, although a couple of them, when half-grown, used to assume a painfully suggestive attitude on the approach of strangers. These same skunks, when I came within the reach, would climb up my legs and get into my arms. They liked to be carried, and never offered to bite."

The doctor's favorite of these pets was called "Meph", and Meph used to accompany him on his drives, curled up asleep in his pocket. Of Meph's performances the doctor says:

"After supper I commonly took a walk, and he always followed close at my heels. If I chanced to walk too fast for him he would scold and stamp with his fore feet, and if I persisted in keeping too far ahead, he would turn about disgusted and make off in a opposite direction; but if I stopped and called him he would follow along at a sort of ambling pace, and soon overtake me. . . . We used to walk through the woods to a large meadow that abounded in grasshoppers. Here Meph would fairly revel in his favorite food, and it was rich sport to watch

his manoeuvers. When a grasshopper jumped he jumped, and I have seen him with as many as three in his mouth, and two under his forepaws at one time."

Miss Evelyn Groesback Mitchell had a pet skunk whose scent-glands had been removed. She writes his story thus

"Billy was not shut up, no indeed! He trotted about the house like a cat. He looked far prettier than most cats and was as fond of being petted although it was no easy task to catch hold of him except by the tail, which proved a convenient handle. All day he would sleep in his box until late afternoon, then tumble out and start on a regular rampage. Little busybody that he was, every corner of the rooms must be inspected. Under all the furniture he would go, nosing about, picking and pulling at every new object. Sometimes he would rout out a spider or croton bug on which he would pounce, gobbling it down in a twinkling. Anything that looked like a hole was carefully inspected. It was his delight to crawl into paper bags and shoes. The waste basket was a favorite diversion. Scaling the side until the basket upset, he would proceed to scatter the contents from Dan to Beersheba, then, seizing the basket by the bottom, he would rush backward about the room. If anyone tried to catch him to stop his careering, he stamped and spit like a bad child.

Billy was easy to feed, eating vegetables, fruit, meat, almost anything but potatoes and white bread. He loved to chew bones and was very fond of sweets. Soon he learned to sit up and beg and could even be induced to walk a few steps on his hind feet after choice morsels.

When unbearably noisy and persistent in refusal to sit still and be petted, he was placed in his box and covered up. It took a pretty heavy weight to keep the lid on, too. This box was his city of refuge in troublous times. There he dragged bits of paper and cloth among which he burrowed and hid bones. He delighted in tearing up paper and simply revelled in the Sunday news.

The rascal was playful enough but his nonsense consisted mostly of rushing about, gnawing, digging with his long foreclaws, (you would have thought he would scrape the bottom out of his box), and dragging things about, preferably shoes or the waste basket. If one cuffed him about he would cuff and grab back, or suddenly, in a funny rage, turn both head and tail toward the offender and up went that tail like a trigger. Then indeed his playmate might be glad that the skunk wasn't loaded.

A neighbor's kitten stood in great awe of him and fled at his appearance, although another used to tussle him all about. When Billy had had enough, you would hear a squeal and the kitten would be nursing a good nip while Billy, with boxed ears fled into hiding.

Once a week Billy, like other civilized people had a wash day. Not that he wasn't clean, for the long fur was always speckless though he never performed his toilet in public. He was just washed on general principles. A comical sight he was as he stood in a pan of warm water, covered with lather, his long tail all draggled. He never bit or tried to run but bore it all with a "meek-as-Moses" expression on his pointed little face. My, my, what a shaking there was when he was rinsed and placed on the floor! Not a sort of reversible buzz-saw skake like that of a dog

but an end-to-end serpentine wriggle so that he looked like two skunks with half a dozen tails, and the water flew in all directions. After a good drying in a rough towel he was as pretty and fluffy as could be."

To the farmer the skunk is a most useful animal despite its tendency to raid hen-roosts, for its chief food consists of grasshoppers, other injurious insects, and field mice. Its home is in a deep burrow, usually made by itself; but sometimes a woodchuck's deserted burrow is utilized; or it may find a nest in a cozy crevice in a stone wall, or in a hollow stump. At the end of the burrow there is a nice bed of leaves where it lies cuddled up in the coldest of weather, although it comes out during the winter thaws hunting for food.

The little skunks are born early in the spring, and in May they are often seen, six to ten of them, following their mother afield on warm, dark nights to hunt for insects. They form a charming and playful family; but if one of them is to be secured for a pet, it certainly would be well to take it to a veterinarian and have the scent glands properly removed.

HOUSE

While Dr. Merriam's skunks had the range of the premises, he says of Meph; "His nest was in a a box at the foot of the stairs, and before he grew strong enough to climb out by himself, he would, whenever he saw him coming, stand on his hind legs, with his paws resting on the edge of the box, and beg to be carried up stairs." Thus it would seem the skunk naturally desires a nest even though it may be given its freedom.

FOOD

Meat and fruit and some vegetables, and plenty of fresh water should be provided. In fact, most of the things which we eat seem to be suitable skunk food.

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A SMELLFUL KITTY

Some animals are smelly
  And some are made to smell,
And thus the matter is arranged
  To suit them both quite well.

I am a pretty kitty
  More smellful than them all,
For I can make a mile of smell
  On provocation small.

Courtesy of Doubleday, Page & Co.

PET SKUNKS

Photo by Verne Morton

TAMING A YOUNG ROBIN

Birds

HEREIN are given general directions for the care of all kinds of birds. These directions were given to me by Mr. Stephen Stacey, a curator of the bird house in the New York Zoological Park, who also generously outlined the care and diet of many species of birds as given in this volume.

All birds must have clean, pure water. Drinking cups should be disinfected often by washing thoroughly in the following solution: Two one-grain tablets of permanganate of potash dissolved in one quart of water.

If birds are affected with looseness of the bowels, they should be given boiled milk to drink instead of water. Bismuth may be added to the boiled milk in the proportion of a small pinch to two tablespoonfuls of milk. Also a pinch of bismuth mixed with hard-boiled egg will serve to tighten the bowels of seed-eating birds.

When the birds are affected with constipation, and this is often the cause of their being dumpish and out of sorts, milk of magensia may be given, four or five drops diluted in the drinking water. Three or four drops of salad oil will also serve to loosen the bowels. Castor oil should never be used, unless the bird is egg-bound.

If the bird seems weak and miserable, a few drops of blackberry brandy, diluted with water may be given. One-fourth as much brandy as water may be given to a bird as large as a jay, but should be much more diluted for a little bird.

THE CANARY

IN the ocean northwest of Africa, and not two-hundred miles away, is a group of islands dear to children the world over, because from there came the cheerful little cage-birds of our households, the canaries. Those privileged to visit the Canary Islands find them steep and rugged, the result of volcanic upheavals; some of the islands are so small as to be mere rocks jutting up from the sea. The highest peak of all, Teneriffe, is 12,182 feet high. The soil is rich, and both tropical and temperate vegetation flourish there; and all told, there is but little more land in all the Canary Islands than in our state of Delaware.

The Canary belongs to the finch family, and is a near relative of our wild goldfinch; as a wild bird, its color is olive or green above, with fine blackish spots on head and rump, and with golden breast. Like our goldfinches, the canaries associate in flocks, and have a curved, wave-like flight. The canary nest is made of moss, dried grass and the down of plants, and is carefully concealed in a shrub or low tree, preferably an evergreen. The nest is usually about ten feet from the ground. The eggs are four and five in number, pale green or blue, spotted with reddish brown. The canaries have not only summer and winter nests, but fall and spring nests also, and perhaps one or two extra to suit the season. They build their first nest in February or March, near the coast, for then the lower levels are warm and comfortable. By the time the first brood can fly the weather of the coast has become hot, so the next nest is made far-

Photo by Verne Morton

MAKING FRIENDS WITH A YOUNG ORIOLE

Photo by Verne Morton

FREEDOM NOT APPRECIATED

A canary out of its cage

ther up the mountain where the temperature is still comfortable; and when this brood is well-grown, the enterprising and industrious parents go up the mountain still higher to a cooler level, and there rear another brood. August finds them rearing their fourth brood near the mountain peaks. Indeed they need to rear many broods in their native islands, for several kinds of hawks are there, and two species of owls that are always hunting for little birds to satisfy their appetites. However, there are no snakes there to steal their nestlings. The food of the wild canary consists of various seeds and fruits; and it is especially fond of figs. A wild annual grass of the Canary Island produces the canary seed which we buy. This grass is now extensively cultivated for the purpose of exporting seed as bird food.

The canaries have spread to the Islands of Madeira, Elba and St. Helena. They were first brought to Europe about three hundred years ago, and were first bred for sale in Germany. In the year 1677 England imported some of these canaries from Germany, but a little later the rearing of birds became a regular business; and at present it has become so important a business in England, as well as on the Continent, that the doings of the canary world are chronicled weekly in their journals with as much accuracy as the rise and the fall of the money market.

The original canary has been crossed with several allied species of European birds, resulting in about fifty well-marked varieties on the market. It is interesting to note that with breeding, the voice of the canary has strengthened, and its songs are sweeter and far more varied than when it was wild. Although its voice has less power and variety than that of the nightingale, it has better power of learning for it has a better ear and a better memory than that famed songster.

SOME NOTED CANARY BREEDS

The Roller, or German Song Canaries have been famous for many years because of their great powers as musicians. They have been bred with especial reference to their voices, and are trained by musical instruments, and by other canaries which are superior singers. The inhabitants of the Hartz Moun-

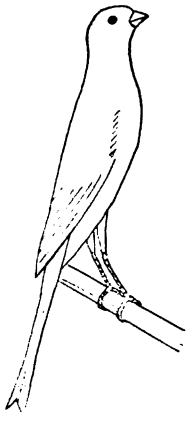
THE CRESTED NORWICH

THE NORWICH

tains are especially noted in the rearing and training of these birds. The St. Andreasberg is among the most famous of these breeds. In recent years the English breeders have also paid much attention to this kind of canaries. No attempt has been made to attain a peculiar or perfect plumage, or a particular form, the whole attention of the breeders being focused upon the voice.

In England, Scotland and Belgium, form and color have been the objects of the breeders, and the following are among the most noted breeds:

The Norwich—this may be crested or plain headed, and may be yellow, buff or variegated in color. It has been estimated that four thousand breeders are engaged in the city of Norwich alone in rearing these birds. It is probably the oldest of the English breeds.



THE YORKSHIRE

The Yorkshire canary is a straight, long bird, with slender, graceful body and long tail. It has varieties of yellow, buff, variegated and green.

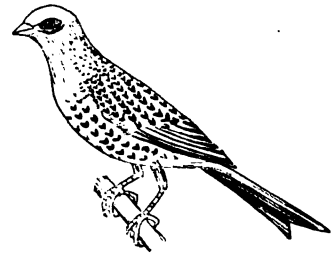
The Cinnamon—takes its name from its color which is golden brown; the color of cinnamon. This is also bred as a crested bird, and there is also a variety which is buff color, and one that is variegated.

The Lizard has its wings beautifully and finely spangled, from the plain colored cap on the head down over the back and wings.

The London Fancy is a stouter bird than any of the above, and is pure colored, except for the dark flight feathers in the wings and tail.

The Scotch Fancy is bred to crescent shape.

The Belgian has a peculiar hump-backed appearance, because of the attitude in which its head is carried, and because the shoulders are high and massive, and held in an elevated position.



THE LIZARD

HOUSE

To make the canary comfortable an oblong cage should be used not less than eighteen inches long; it should be large enough to permit the bird to exercise freely. The perches should be rounded and of different thicknesses to give a change to the bird's feet; they should be from three-eights inch in diameter to that of twice the thickness of a lead pencil,

THE LONDON FANCY

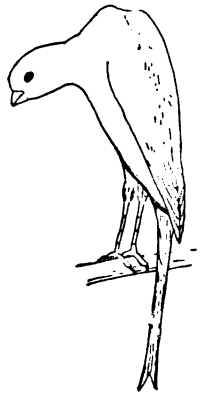
THE SCOTCH FANCY

and at least one perch should be oblong in cross section, with the lower side flat. Perches should be placed so as not to interfere with the bird's exercise, but should be convenient to the food and water; they should be cleaned every day or two. The cage should be hung where there is plenty of light, but not above a gas jet; and it should never be in a draft, for these birds are very susceptible to drafts. It should not be hung in a window. We should remember that in their native islands canaries live in an equable temperature. They can endure a temperature rather cooler than we usually prefer in our living

rooms, but sudden changes are to be avoided. It is well to keep the cage floor covered with sand; at least sand should always be present in the cage, and accessible. If sand is spread over the floor it should be renewed twice a week. Many people put paper on the cage floor as it is easily removed and replaced.

FOOD

The standard canary food is a mixture of the seeds of canary grass, millet, rape and hemp, but the seeds of many grasses that grow as weeds in our rich gardens are relished; and these may be gathered in the late summer for occasional use in the winter. A little green food should be given every day, such as chickweed, lettuce and tender grass, and especially the green seed stalks of common plantain may be given in summer; in winter, sweet apples, a section of orange, a slice of raw potato, or carrot, or a leaf of cabbage is acceptable. A bit of dry bread, or sometimes bread soaked in milk, is eaten eagerly for variety. Green foliage with plant lice on it is an especial treat to a canary. Grit of some sort must be kept constantly accessible. Canary bird grit may be bought at the food stores. A piece of cuttle-fish bone should always be kept within reach of the bird to aid digestion, and also to keep the beak from growing too long, and out of shape. Lump sugar should not be given.



THE BELGIAM

Be very careful to get the seed of the summer rape—which is a small, round, reddish seed. Mustard seed, which is larger and black, is not acceptable.

The seed diet of English canaries should consist of two parts canary seeds, one part rape seed, with a little white millet, plantain, groundsel and chickweed seed. German canaries should have two parts rape, one part canary seed, and a little white millet.

Those firms making a specialty of bird foods, like the famous Spratts, sell a wide range of seeds and insectivorous foods, tonics and medicines, with which it would be well for the keeper of canaries to become familiar.

My neighbor, Mrs. Frederick Bedell, resuscitated her canary after it was lying apparently dead from a chill. She mixed a drop of bacon fat with cayenne pepper, and forced it into the beak of the bird, and after a little it revived; she kept it wrapped warmly until it seemed quite recovered. For a day or two she gave the bird a little of the fat and the pepper daily. A piece of raw, salt, fat pork given three times a week is a great help to a bird suffering from a cold and hoarseness.

CARE

It is most necessary that the drinking dish be filled with fresh water daily, for these little prisoners need to drink often.

The canary should have an opportunity to bathe three times a week. The bath dish should hold water to the depth of three-fourths of an inch and it is a good plan to have a layer of clean sand or gravel in the bottom. The water should be tepid. To give the bird its bath, take the cage off its base and place it over the bath tub; then remove the perches and the seed and drinking cups so that there may be nothing to distract the bird's attention from the business at hand. The birds imported

from Europe are accustomed to the outside bath, which is a little bath cage that may be hung to the open door of the bird-cage. This is sold by all importers of foreign birds and costs about $.75. After the bath the bird may be placed in the direct sunshine, if not too hot, for twenty minutes. It must not be exposed to drafts.

It is most desirable that the canary should be allowed to fly about the room for a time each day, this gives it the needed exercise to keep it healthy.

When the period of moulting arrives the canary needs special care. Moulting is a very taxing process and the bird's vitality becomes low. Soft food, prepared as follows, may be given: Chop fine a hard-boiled egg, with an equal amount of soft cracker or bread-crumbs, mix with a heaping teaspoonful of cayenne pepper. This should be kept freshly prepared in the feeding cup, so the bird can have constant access to it. The cage should be kept in a warm place (not hot) where there are no drafts. When the new coat is grown, the soft food can be discontinued. Feeding the cayenne pepper at this time gives warmth for digestion and aids in making the plumage beautiful and of good color. The bird should not bathe every day when moulting, but it may bathe occasionally. The birds usually moult in mid-summer.

In caring for these pets in sickness there are a few things that we can do. If the bird seems dumpy and sits still with feathers ruffled, when it is not moulting, it is very likely to be suffering from constipation. Note whether the droppings on the cage floor are scarce and dry. If so, open the bird's beak and with a pipette give it four or five drops of milk of magnesia diluted in water or three or four

drops of salad oil. This will usually afford relief. If not, inject into the bird's anus four or five drops of castor or olive oil with a pipette. A diet of fresh carrot is a great help in cases of constipation.

In cases of diarrhœa, give boiled milk instead of water and give bismuth mixed with hard boiled egg. Five or six drops of brandy in the drinking water is also a remedy.

Often the feet of canaries become scaly and diseased, and the claws fall off. In this case the perches should be dipped in peroxide after they are cleaned, and a few drops of caraway-seed oil mixed in vaseline should be applied to the bird's feet once a day until they are cured. Care should be taken that the feet are washed and wiped dry before the vaseline is applied. Overgrown nails should be clipped at the tips but not deep enough to hurt.

It seems a pity to keep one canary alone. Two are company for each other, even though they may be kept in neighboring cages, and thus give each other cheer without annoyance.

NESTING

A pair of birds will usually live quite happily while nesting. When this season comes, special care is needed. As soon as the hen begins to beg for food from her mate, and he begins to feed her, the nest box should be put in the cage near the top. This should be a box about 3½ inches square and 2 inches deep. Bits of moss, wool, hair and dry grass should be put against the bars of the cage, where they can be pulled through bit by bit by the busy nest makers. The hen is likely to be fussy about her nest, and will place a mass of material in it only to dump it out again. If it falls to the bottom of the cage it will soon be soiled, and should be removed.

It is very interesting to watch the tender care usually given to the mother bird by her mate while she is incubating. He feeds her, and seems to take the greatest interest in her. My own especial pet bird, Kim, has interested me greatly because of his solicitous care of his mate, and his pride and joy in the eggs. When she comes off of the nest he will slip onto it and sit very proudly; and one day I found him sitting with her on the eggs, surely a most tender and touching companionship. If the male is cross, he should be removed after the eggs are laid, and allow his wife to sit in peace. Some recommend a nest of wire-netting lined with felt. This is usually used by regular breeders, but the writer always liked to give her canaries the fun of building the nest.

Breeders advise the use of a large cage during the nesting period, in form of a wooden box with the front wired. It should be about two feet long and the same in height and at least a foot in depth. There should be a large door and a sliding bottom so that it may be easily cleaned, and of course the cage should be fitted with food and water dishes. This cage may be made by any boy who can use carpenter tools.

Hard boiled egg minced with stale bread should form a part of the diet of the nesting bird. When near time for the young to hatch give some hemp seed and plenty of green stuff and fruit.

LOSS OF VOICE

Often the canaries will cease to sing, and this may be due to several causes; the most common is a cold caught by allowing the cage to be in a drafty place.

A very eminent English authority advises the following treatment: Give first a drop or two of castor-oil, then place in a drinking dish with water, a small teaspoonful of glycerine, a bit of gum-arabic, as large as a pea, and twenty drops of paregoric; also give a more generous diet. Another English authority advises giving a little stale bread steeped in warm milk, with honey dropped upon it while warm. Another advises putting from two to six drops of whiskey in the drinking water.

Of course during the moulting season the birds do not sing.

CANARY MAXIMS

Do not force the canary to bathe.

Do not hang the cage in the window, for in this situation there are always drafts, which will result in the bird's loss of voice.

Do not expose the bird to direct sunshine except for a short time after it has bathed. Make an envelope of thick wrapping paper to fit around the cage for protection during nights in cold weather. This must fit closely around the bottom of the cage and be open above.

Avoid sudden changes of temperature for the canary,—about 70 degrees F. is the most desirable temperature for this bird.

If you wish your bird to sing his best, do not hang the cage in the strong light.

The cuttle-fish bone should be changed every three months, since it loses its salt by exposure to the air, and therefore helps less in digestion.

Examine the rape seeds which you buy, carefully. Summer rape, which is the most desirable food for the singing canary, is a small, reddish, round seed. The larger round black seeds of mustard are often mixed with the rape and are not relished.

If the bird wastes the seeds without cracking the husks, soak the seeds in tepid water for an hour or so before feeding, drain them on a dry paper or cloth before putting into the food-cup. The next day the cup should be emptied and scalded so that there may be no danger from musty seed.

One large teaspoonful of seed is all that one bird needs for a day.

To coax a canary to be tame and companionable, give it a few seeds of hemp now and then from the fingers or the lips.

If tiny red mites or bird lice are seen about the cage, the bird should be removed and the cage and perches washed in creolin. This should be rinsed off in hot water and the cage thoroughly dried before the bird is returned. The bird should have a good insect powder like "buhach," thoroughly dusted through its feathers.

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PARROTS

ONE of the most ancient of birds is the parrot, and it remains true to its type. There are fossils in Miocene rocks that show the parrot as it is to-day. The ability of these birds to talk, and their interesting habits, caused them to be made pets by ancient savage peoples, especially of India and Africa. The Romans brought these birds to Rome from India and Africa, in the time of Nero; later the price of one of them was as great as that of a slave. Parrots were first introduced into northern Europe about the time of the discovery of America, Columbus having brought back several on his first expedition.

The parrots are all tropical or subtropical birds, although in the Himalaya mountains they occur as high as 4000 feet, and in the Andes they have been found at snow-line. They are social, and usually fly in flocks, their gorgeous plumage matching the brilliant flowers of the tropical forests. While in general they are short legged, and are awkward on the ground yet there are parrakeets in South Australia which live on the ground and are swift runners. These brilliant birds are as common along the roads there as are sparrows here.

If we tried to visit all the parrots in their native countries, we should have to go to South America, Australasia, Africa and India; and wherever we found them, or whatever their color and size, they would surely all have thick, lithe, finger-like claws which

Courtesy of Doubleday, Page & Co.

A PARROT LEARNING A BUGLE CALL

Photo by Verne Morton

A GOOD NATURED POLLY

they use like hands. The first and fourth toes extend backwards, the second and third forwards, and thus afford the bird a strong grasp on twigs and limbs. The body is always rather stout, the neck short and the head large. The upper half of the beak is strong and curved, the lower half scoop-shape, and the tongue cylindrical. In all except one genus there are twelve tail-feathers. At the base of the beak where the nostrils open, there is a swollen area, which may be feathered. In the tropical portions of our own continent are found the sharp-tailed parrots, which have the long tail feathers tapering to a point. In Brazil and Paraguay are found the splendid macaws, brilliant blue, yellow, green and red, some of them quite thirty inches in length. In these same forests are found the little parrakeets, or American lovebirds, usually less than five inches in length, and green and blue in color. In tropical America there also occur the blunt-tailed parrots, which are medium size, with green plumage, and very good talkers. Humboldt found one of these birds talking the language of an Indian tribe which had become extinct. Strangely enough, there is a genus of the blunt-tailed parrots that live in the Sahara desert. In north Africa, too, is found the gray parrot with the red tail, which is the favorite pet, because it excels in conversation.

In Africa dwell the true parrakeets, those that have the two central tail-feathers very narrow and long, forming the point of the long graduated tail. The parrakeets extend out through Mauritius, Ceylon, India, and the East India Islands. The rose-ringed parrakeet is found in Africa, and especially in India; it has a body only seven inches long, and a tail which measures ten inches. Its plumage is soft

green—the bill red—and the males have a pink ring around the neck, with a black patch in front. These live in the open ground around the villages, and perch upon the roofs of the houses and temples; they gather in great flocks at sunset, and perch at night in the trees. Kipling thus describes them:

"Dim dawn behind the tamarisks, the sky is saffron yellow,
As the women in the village grind the corn,
And the parrots seek the river-side, each calling to his fellow
That the Day, the staring Eastern Day, is born."

In Australia and surrounding islands occur the broad-tailed parrots, among them the "Rosella", or "Pretty Joey." This bird is a little more than a foot long; it has a scarlet breast, is yellowish green above, has wings dark blue and a blue tail with two central green feathers; it is one of the most brilliant of its family.

In New Zealand is the kakapo, or owl-parrot, which lives on the ground and remains hidden all day, coming out at night to feed. In India, the Philippines and the islands of the Malay Archipelago, are the queer little bat-parrots, or lorikeets; scarcely more than six inches in length, and with rainbow plumage, of green, scarlet, blue and yellow. The beaks of the lorikeets are not hooked, but are slender and fitted for extracting the nectar from flowers like the beaks of humming-birds. The lorikeets sleep hanging with the head downward, and feet safely clasping the branch, and thus they earned the name of "bat-parrots."

There are a great variety of nests built by parrots. The Argentine green parrakeet builds at the extremity of branches which it weaves closely together. The macaws build in holes in trees, especially the wild fig

tree. There is one parrakeet that builds in holes along the river banks, while the kakapo and night-parrakeet build on the ground in tussocks of grass. The incubating period is about twenty-four days, and the father bird helps incubate. The young are born helpless, and are tenderly cared for by thcir parents until fully grown. The parrots remain mated for life, and make devoted pairs. Although they are social, and fly in flocks, Dr. Arthur A. Allen states that in Central America it can be easily seen that they fly in flocks by pairs. He also says that though the isolated parrot seems so brilliant, its colors particularly fit it to become invisible when in trees and looked at from below; and although the racket they make is ear-rending yet one rarely gets a glimpse of the birds.

In climbing trees the parrots use both their feet and beaks, and these same convenient organs enable them to gather fruits, seeds and nuts, of which they are very fond. In some countries they are pests, because they attack trees in fruit, and grain in the fields. In Mexico they often damage the corn in the milk stage.

Parrots are long-lived; authentic instances of their reaching the age of seventy have been recorded. One is described as reaching the age of ninety-three, and becoming very decrepit and helpless. Parrots never forget a person that annoys them, and therefore they should always be treated with gentleness, excepting when punishment is necessary. They are birds with strong likes and dislikes, which to us are quite mysterious. A parrot I knew fell in love with one of twin spaniels when he was a puppy; the two puppies were seemingly exactly like, but the bird chose one and would have nothing to do

with the other. She would play with her favorite with every sign of enjoyment; he would paw her feathers ruthlessly, and yet she seemed always to like it, the while every other dog on the place stood in mortal terror of the bird.

HOUSE

The parrot's cage should not be circular. It should be at least two feet high, and one foot six inches to two feet or more in either diameter. There should be two perches, the top one thinner than the lower one. The thinnest should be at least a half inch in diameter. If the parrot prefers a ring to swing on, this may be substituted for the upper perch. It is best to have a door slide up and down rather than to swing on hinges. The cage should be made of galvanized wire, and flat on top. The food dishes should be removable from the outside.

The cage should be placed in a warm room in winter, although it may be kept outdoors during the day in summer; but the bird must never be exposed to a cold draft. The cage needs to be cleaned every day, and the floors should be covered with clean white sand, or else with dried soil. If possible, each day the parrot should be allowed to come out in the room and move around, and should be given an opportunity to sun itself if possible. A brass cage should not be used.

FOOD

The parrot is chiefly a seed and fruit eater, the food varying somewhat accordingly to the species. A suitable food is a mixture of hemp, sunflower seeds, unhulled rice, and cracked corn. Some ripe

fruit, preferably bananas, oranges, cherries and apples, should be given occasionally. A fresh twig should be given the parrot to nibble. A bit of cuttle-fish bone is acceptable, and sand should be scattered on the bottom of the cage. A little red pepper added to its food will often cure the ailing parrot. The bird should be kept out of the dining room, and it should not be fed from the family table. It should not be fed fish, or bread soaked in milk; this food is too heating, and causes it to pluck out its feathers. Lettuce may be fed, but parsley and chickweed never should be given, and on no account should bones, meat or grease be given. Baked peanuts have a tendency to keep the bowels from becoming too relaxed. Some advise hazel nuts, almonds and walnuts; others maintain only peanuts should be allowed. The individual tastes of the bird should be considered, and it should be given what it most relishes.

CARE

Water should be given two or three times a day, and after the bird has taken its drink the drinking dish should be removed. Some authorities say neither coffee or tea should be allowed. Others advise the giving of clear, black coffee if water causes diarrhœa.

If the parrot wishes to take a bath, it should be given opportunity preferably outside of its cage, since it is a great splasher. The gray parrot prefers to roll in the dust rather than to bathe, and should be given a tray filled with fine dust for that purpose.

The dishes for the food must be kept very clean, and often scalded. No remnants of food should be allowed in the cage the day after it is given.

A piece of soft wood for the parrot to tear in pieces should be kept constantly in the cage, half decayed sticks do well for this. While it is not known that this nibbling of wood has any affect upon the parrots health, yet it seems to be a necessity for the bird's entertainment and happiness. If wood is not given, the parrot often tears its perches to slivers. It enjoys playing with spools and finds much entertainment in mauling a wooden or strong china doll.

It should be remembered that there are many species of parrots and parrakeets used as cage birds. Each species has it peculiarities which should be studied. We should find out all the facts possible concerning our kind of parrot from books and bird dealers, and we should study our own individual bird, so as to know best how to treat it. We should always show the parrot gentleness and affection, and never laugh at it when trying to break it of a bad habit. It is only by kindness and persistent efforts that this bird can be taught good habits. In teaching the parrot to talk, a lesson should be given in the morning, and again in the evening, standing close to the cage and repeating the words very distinctly. If the bird remains very quiet, it is in all probability learning the lesson, although it may not repeat the words for several days. We ought always to teach our parrots to say sensible and reasonable words, for it makes them far more interesting.

At a certain winter resort in the South a very talkative parrot was kept. To this hotel came a woman with her husband and children as guests. The woman was hysterical and irritable, and scolded her husband and children in a shameless manner. For a week the parrot remained quiet, and could

not be induced to say a word; then, one morning he began to scold in the exact tones and words of the woman; he scolded the husband, and scolded the children in a way that convulsed with laughter the other guests of the hotel. The woman did not enjoy listening to her conversation repeated by the parrot, and left the hotel, a wiser and better woman, it is to be hoped.

Most parrots do not like strange experiences. The cage should always be kept in the same place, and when there is an out-of-door perch it should always be kept in the same situation.

For keeping the parrot healthy there are reliable foods, tonics and remedies, like those furnished by the Spratts, Holden and other dealers.

Parrots are subject to inflammation of the lungs and bronchitis. The remedy is to keep the bird in a room where the temperature is 80°F., and the atmosphere of the room should be kept moist by the steaming kettle; it should be fed warm milk or broth at intervals of an hour or two hours during the day and night. Dr. W. T. Greene, a noted English authority advises for both pneumonia and bronchitis fifteen drops each of glycerine, oxymel of squills, and mucilage of gum acacia, added to one ounce of tepid water, of which the sick bird may be given three of four sips at intervals of three or four hours during the day and night. The same authority advises for cold in the head, five or six drops of tincture of aconite to a fluid ounce of drinking water, to be given in small quantities every two or three hours.

For constipation, give olive oil as an injection with a small syringe. Give also a dose of ten drops mixed with half a teaspoon of honey twice per day.

For diarrhœa give bismuth in boiled milk. Keep the bird warm and feed unhulled rice exclusively, with a red pepper to peck at. A cracker soaked in brandy is sometimes a remedy.

Some parrots contract a disagreeable habit of picking their feathers. This may be caused by bird lice, or other parasites in the feathers. Dusting the bird with buhach, or some other pure powdered pyrethrum, will kill the parasites. Sometimes this habit is caused by skin irritation due to indigestion, in this case the diet should be changed, and a teaspoonful of fluid of magnesia may be put in the water in the drinking cup. In some instances there seems to be no reason except uneasiness on the part of the bird, in which case, its attention should be diverted. Dr. Greene advises putting the bird in an out-of-door aviary for this. At least it should be given new wooden playthings and should be kept on a diet of hemp and unhulled rice with a bit of apple or banana.

Each individual parrot has its owns peculiarities, and these should be studied by the owners, and the bird treated accordingly.

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From Country Life in America

WHISTLING TO THE COCKATOO

COCKATOOS

THESE birds have great crests which they can erect at will; they are never green like parrots, but are usually white or gray or brownish, with the crest of brilliant color, and often with brilliant colors on the under side of the tail. In many respects they differ from other parrots. They are more affectionate, and perhaps more dependent upon the devotion and kindness of their master or mistress. They are naturally gay and happy birds, full of delightful tricks. I once saw in the Zoo two of these birds playing with each other like a pair of kittens, rolling over and over on the floor. At first I thought they were fighting but it was real play. They are quite as intelligent as parrots, and can be taught to speak, although usually not so proficient as the parrots in this gift. While they are very noisy when several are kept together, this tendency may be much reduced in the individual bird by giving it affectionate care. If the cockatoo is happy and healthy and well-cared-for, it seems to forget to squawk. The most common of the pet cockatoos are the rose-breasted, the sulphur-crested, the rose-crested and the lead-beater. The cockatoos come from Australia and the Indian Islands. They make their nests in decaying trees.

HOUSE

The cage of the cockatoo should be like that of the parrot, excepting that this bird is usually larger, and should therefore have more ample quarters.

FOOD

Equal proportion of sunflower seed, hemp seed and oats form a very excellent dietary. Apples, bananas and grapes may also be given.

CARE

These birds must be kept free from cold and drafts, although Mr. Stacey informs me that the rose-head and sulphur-crested cockatoos are kept out-of-doors the year around in the New York Zoological gardens with only a shelter to which to retire. In general, the care given to the parrots applies to the cockatoos.

THE PARROT

Within her gilded cage confined I saw a dazzling Belle,
A parrot of the famous kind, whose name is Non-Pareil.

Like bead of glossy jet her eyes; and smoothed by Nature's skill,
With pearl or gleaming agate vies her finely-curved bill.

Her plumy mantle's living hues in mass opposed to mass,
Outshine the splendour that imbues the robes of pictured glass.

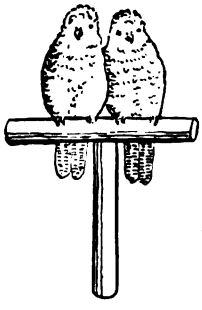
And, sooth to say, an after Mate did never tempt the choice
Of feathered thing most delicate in figure and in voice.

But, exiled from Australian bowers, and singleness her lot,
She trills her song with tutored powers, or mocks each casual note.

No more of pity for regrets with which she may have striven!
Now but in wantonness she frets, or spite, if cause be given;

Arch, volatile, a sportive bird by social glee inspired;
Ambitious to be seen or heard, and pleased to be admired.

William Wordsworth.



LOVE-BIRDS

THESE little members of the parrot family have earned their name by the devotion shown to their mates. A pair will sit closely side by side on the perch, cheek against cheek, or often bill touching bill for long periods of time. However, their love is not wide in its scope, and does not include other love-birds, and especially not other species of birds, toward whom they act most spitefully if given opportunity. The gray-headed love-bird comes from Madagascar, and is quite hardy; it is about the size of an English sparrow; the male being green, with a purplish gray neck, while the female is entirely green. In its native wilds the female has an interesting manner of carrying the shreds of bark with which to line her nest tucked safely beneath the feathers of her back, a wise way to carry a load.

The rosy-faced love-bird comes from southwestern Africa. The face and beak are red, and the remainder of the plumage green. The wings of the male are lined with black. It is more delicate than the gray-headed, and needs tender care. These birds occur in their native land in small flocks, and fly with exceeding swiftness for short distances. Their food consists of berries and similar fruit seeds. They are in the habit of using the nest holes made by other birds for their own nests.

HOUSE

The love-birds should have large cages, giving them plenty of chance for exercise.

FOOD

Canary seed and millet, and some green food should be given.

A PARROT

Kept as a pet on the Island of Mull, one of the Hebrides.

The deep affection of the breast, that Heaven to living things imparts,
Are not exclusively possessed by human hearts.

A parrot from the Spanish main, full young, and early caged, came o'er
With bright wings, to the bleak domain of Mulla's shore.

To spicy groves, where he had won his plumage of resplendent hue,
His native fruits, and skies, and sun, he bade adieu.

For these he changed the smoke of turf a heathery land and misty sky,
And turned on rocks and raging surf his golden eye.

But petted, in our climate cold he lived and chattered many a day;
Until with age, from green and gold his wings grew grey.

At last when blind and seeming dumb, he scolded, laughed, and spoke no more,
A Spanish stranger chanced to come to Mulla's shore.

He hailed the bird in Spanish speech, the bird in Spanish speech replied
Flapped round the cage with joyous screech, dropped down and died.

Thomas Campbell.

THE CROW

THE ways of crows are most interesting to the naturalist. Although this bird is so common, we have not yet become fully acquainted with its more intimate life, and there is always something new to be seen and recorded by those who are patient and observant.

The crow builds its nest of sticks, grape-vines, bark, sod, grass, moss, and horsehair. The site of the nest is in a tree or tall bush, usually more than twenty feet above the ground; near the top of some old hemlock is a favorite situation. The eggs are pale bluish-green or nearly white, with brownish markings. The young crows hatch in April or May. Both parents devote themselves to the care of the brood for the entire season.

Except during the breeding season the crows are very social. They gather in flocks numbering fifty to one thousand individuals. They all roost together, usually in pine or hemlock forests, or in other evergreen trees. They remain in such roosts during the entire winter, coming out each day for food. They often make journeys of many miles to thus get their "daily bread." When the crows are feeding in the field there is usually a sentinel posted on some high point; the sentinel is a wise old crow of much experience, and he gives the warning of danger when the enemy approaches.

In the wild state, the crow is a general feeder. Usually it finds its food upon the ground, taking large numbers of grasshoppers, grubs, cutworms, and

other insects, snakes, toads, frogs, mice, etc. It is also partial to the nestlings of other birds when it finds them. It feeds upon a large variety of wild berries, and is particularly fond of sprouting corn. Its liking for the last-named delicacy, and its clever ways of obtaining it, have served to show how shrewd the crow really is.

Next to the raccoon, the crow is the most mischievous of pets, and at the same time the most interesting. It is necessary to take a crow when a fledgling in order to bring it up successfully as a pet; although there have been records of crows that were injured, and thus captured and fed, becoming quite tame, yet the young bird is the more apt learner.

The crow's propensity for stealing all bright and shining objects makes it rather dangerous to allow the bird the freedom of the house. Thimbles, jewelry, pins and needles it steals to carry off and bury or hide in some secluded spot. Mr. Thompson-Seton in his story of "*Silver Spot*," gives a most interesting account of the crow's aesthetic interest in glittering objects. However, it is not always the glittering object that attracts, for a pet crow of our acquaintance was so in the habit of stealing the clothes-pins off the line, that he was kept in confinement on wash day.

The crow is not only intelligent, but very imitative, and therefore may be taught many tricks. Mr. Lottridge writes of a crow taught to hop over sticks, jump through a hoop, hold a pipe in the beak, and to pretend it had a broken wing. The writer's experience with tame crows has been confined to two, Joe and Billy. Joe was the pet of a farmer, and particularly enjoyed helping about the farm work. He always assisted in digging the potatoes by keeping

abreast of the workers and pulling up a stem and scratching a little at each hill. One day he tried to help his master weed the onion bed but he was not very discriminating between weeds and onions, and was driven off. Indignant at this treatment, he waited until the coast was clear, and returned to finish the job, by pulling up every onion in the bed.

Billy was the special comrade of a little boy, with whom he was fond of playing marbles. The boy would shoot a marble into a hole, and then Billy would take a marble in his beak and go and drop it in the hole. Thus they would play turn and turn about for hours of the day. Billy was always very angry if the boy insisted on shooting his marble out of turn. Billy also learned to talk the language of the chicken yard. He was especially proficient in making the noise which the hen makes when calling her chickens to food. Billy would put his beak down to the ground in imitation of the hen, give the call, and then, when the overgrown chickens came rushing to seize the tid-bit, he would take a mouthful of feathers out of the back of the nearest one and go off chuckling to himself. Billy also learned to imitate the call to dinner.

HOUSE

The crow should not be confined in a cage, but should, with a clipped wing, be allowed freedom of the grounds and barn. It will consort with the hens if allowed, and make itself generally at home. When confined in a cage the crow is a very dirty bird, and the cage ill-smelling despite reasonable efforts to clean it.

FOOD

The crow eats grain, meat scraps, and almost any of the refuse from the table. It may be fed chopped raw meat, mice and worms; it is fond of berries of the Virgina creeper, and many other wild berries. Grain or corn should be softened before giving it to the bird.

CARE

The crow should have plenty of fresh water for drinking and bathing.

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THE CROW

With rakish eye and plenished crop.
  Oblivious of the farmer's gun,
Upon the naked ash-tree top
  The Crow sits basking in the sun.

An old ungodly rogue, I wot!
  For, perched in black against the blue,
His feathers, torn with beak and shot,
  Let woful glints of April through.

The year's new grass, and, golden-eyed,
  The daisies sparkle underneath,
And chestnut-trees on either side
  Have opened every ruddy sheath.

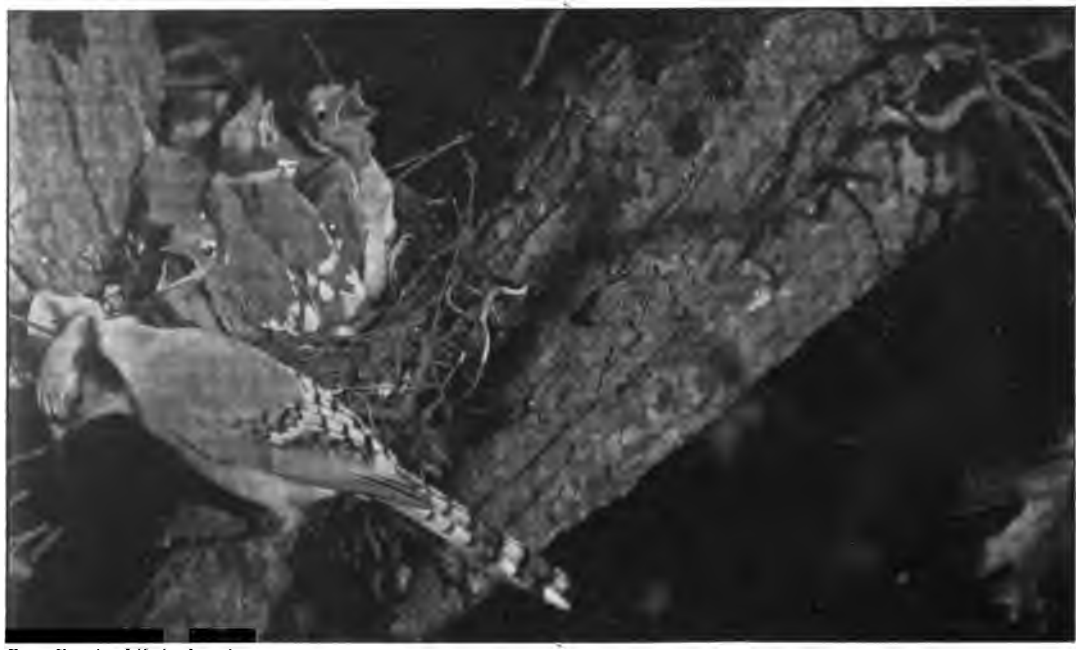
But doubtful still of frost and snow,
  The ash alone stands stark and bare,
And on its topmost twig the Crow
  Takes the glad morning's sun and air.

William Canton.

Photo by Verne Morton

CHUMS

A boy and his pet crow



From Country Life in America

A BLUE JAY FAMILY
Hungry youngsters and a discouraged parent

THE BLUEJAY

IF YOU desire a pet to test the patience of the household, by all means take a nestling bluejay and rear it. It will be happy all day long, if it can find enough mischief to occupy its time. It will destroy books and furniture, especially the upholstery, and carry off all the pens, pins and jewelry that it can lay beak upon. It will soon learn to make raids upon the kitchen, in fact, there is little in the household that it will not meddle with in the course of its active life. Nevertheless, despite its records of mischief, and despite its beautiful plumage, the bluejay as a pet, cannot equal the crow.

As a wild bird, the bluejay often remains in the northern States during the winter. For most of the year the jays live in mixed woodlands in noisy flocks, screaming and chattering in a most disagreeable manner, from the hearer's standpoint. They especially enjoy harrowing a sleepy owl, and by their scolding bring all the other birds of the forest to join in abusing this fluffy enemy, who snaps his beak and ruffles his feathers in a vain attempt to frighten his tormentors.

The jays are such excellent bird linguists that they learn to imitate many sounds; they also enjoy playing practical jokes at the expense of other birds. For instance, a jay will suddenly give the scream of a hawk, and then seems to enjoy seeing all the scared little birds slip away in fright. It will also imitate a small bird in distress, and thus bring about it a

great number of other birds that hasten to the aid of the supposed victim.

But when nesting time comes, the last of April or early May, the whole character of the jay changes. It suddenly becomes the quietest and shyest of birds and no longer screams or associates with its fellows. Each pair finds a secluded spot and builds in a tree-crotch, from ten to twenty feet from the ground, a rather bulky nest of twigs, firmly interwoven, and lined with soft rootlets. In this well protected nest from four to six brownish or olive cinnamon-spotted eggs are laid. The devoted parents seem to have lost their voices, and talk in whispers, or mew softly to each other, like little "pussy cats". Not until the youngsters are able to leave the nest do the parents resume their noisy social habits.

HOUSE

A pet jay should not be kept in a cage. It is likely not to live when thus confined, unless the cage be as large as a small room. It should be given the freedom of the premises where it can get into mischief and be happy.

FOOD

The jay is a general feeder. When young, and taken from the nest, it should be fed on bread and milk, hard-boiled eggs minced, and a little chopped raw meat should be given each day, with whatever insects may be found. When older, the bird will thrive on nuts, green peas, fruit, large insects and mice. In case there are no insects, give the bird a bone with a little meat on it, and let him pick it as entertainment. A bluejay always enjoys his food

better if he thinks he is stealing it. One of his favorite diversions in the forests is stealing nuts from squirrels, therefore it will add to the bird's zest in life if you hide the food in certain places, which he will soon get to know. The bird should always have access to fresh water

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"Mr. Bluejay, full o' sass,
In them baseball clothes of his,
Sportin' round the orchard jes'
Like he owned the premises!

James Whitcomb Riley.

"Clad in blue with snow-white trimmings,
Clean and smooth in every feather,
Plumed and crested like a dandy,
Keen of vision, strong of muscle,
Shrewd in mimicry and dodging,
Knowing every copse and thicket,
Warm in snow and cool in summer,
Is the bluejay still a villain?
Outlawed by all bird tribunals,
As a wretch disguised, he's branded,
Shunned by every feathered creature;
Yet he prospers, man admires him."

Frank Bolles.

THE MAGPIE

MAGPIES are related to the crows and jays, and have habits like theirs in many respects. They are striking birds in irridescent blue-black and white uniforms and have very long and expressive tails.

Magpies are social, and usually occur in small flocks. They are noisy, their voices being harsh and unmusical. They find much of their food on the ground. It is interesting to watch a magpie feed; it hops about with great agility, making sudden leaps this way and that, when hunting grubs, snails and grasshoppers.

The magpie nest is a complicated structure of sticks and mud built in layers; it is lined with fine roots, and over the whole is placed a roof of sticks, leaving a door at one side. Around the door, and over and above the whole nest is placed a covering of thorns to discourage visitors. The nest is situated in a high tree, or in a dense bush.

The magpie which we buy of the bird-dealers is usually the European species; but we have in our Western states, from Arizona to Alaska, a magpie which is considered a variety of the European species. It builds a nest like the latter, except that it has another opening opposite the door for the accommodation of its long tail.

As a pet, the magpie is as cunning and mischievous as the crow or jay; and it can learn to talk better than either. It is able to say whole sentences and laugh hilariously. It loves to steal and hide glittering objects; it is especially inquisitive, and will in-

From Country Life in America

MAGPIES AND THEIR NEST

Photo by Verne Morton

TAMING A YOUNG CHICKADEE

sist on taking part in everything that is going on, unless confined. The annals of a pet magpie, if faithfully kept, would prove a most amusing biography.

HOUSE

If kept in a cage, a large one is necessary. A packing box, about five feet square, with one side wired, would give the bird ample room. However, if it is reared in captivity, the bird should be given the freedom of the house and grounds. One of its wings should be clipped to prevent its straying.

FOOD

Raw meat, especially beef and mutton, should be given, and to it should be added oatmeal mixed stiff, and table-scraps. It is very fond of picking the meat from a bone, and eats mice, and insects with great gusto. A drinking cup filled each day with fresh water should be kept accessible.

CARE

The magpie should be given a chance to bathe every day, and a protected, warm corner in which to dry its plumage. If kept in a cage, the latter should be cleaned often. If allowed to wander free, it should be shut up nights to keep it away from cats.

THE OWL

OWLS have long been considered the wisest of birds, probably because their great eyes look like spectacles, and their crooked beak like an intellectual nose. If the owl's form were the result of its thought, it would indeed merit the reputation of wisdom for it is a bird marvelously adapted for its life.

It is a creature of the night, and its great eyes have an iris that opens wide in the dark, and shuts to a little round pupil in daylight. The owl, like the cat, sees in the dark by using the light twice, and this enables it to fly about avoiding branches and obstacles; but it gains its knowledge of the whereabouts of its prey largely through its acute hearing. Its ear instead of being a mere opening in the head, consists of a fold of skin, forming a channel which extends from above the eye around to the side of the throat. It can detect the slightest rustle of mouse or bird, and pounces in the direction from which the sound comes. It seizes its prey in its sharp claws; the outer toe can be moved back at will in order to give it a better grasp. The curved beak is used to tear its victim in pieces to be swallowed.

In order to secure its prey, the owl must move silently; its plumage is very fluffy, and its wing feathers instead of having stiff edges, like those of other birds, are bordered with soft fringes which cushion the stroke of the wing on the air, and render the flight noiseless.

Photo by Verne Morton

A SLEEPY YOUNG SCREECH OWL

From Country Life in America

A SCREECH OWL AND ITS BREAKFAST

Usually the plumage of the owl is brown and speckled, and is very protective. During the day these birds like to retreat into the thick foliage and sit there humped upon the branches, and they look more like great knots or broken branches than like living creatures. The owls are devoted lovers, and remain paired for life.

The cry of the owl is a blood-curdling sound, and undoubtedly serves to startle timid little creatures into activity, and thus give the owl information as to their location. One morning before daylight, I was lying awake in our summer camp in the woods, when I heard a screech-owl hoot, and then a scamper in the dry leaves followed; the owl came nearer and perched on a stump and hooted again; there was another rustle in the leaves, and the owl pounced upon the spot, and I heard a squeak of terror on the part of the mouse. I was convinced that the owl hooted that time to make sure of the whereabouts of its victim.

The digestive system of the owl is peculiar, and needs to be, considering the bird's table manners. It swallows its prey as nearly whole as possible, and lets the stomach do the work of selecting what is nourishing and rejecting what is not. Thus the hair of mice, and of other small animals, feathers of birds and the bones of both are rolled together into pellets in the stomach and are later thrown up.

As a pet, the owl is not an attractive cage bird. It is very difficult to keep the cage clean, and almost impossible to keep it from becoming smelly; moreover, these birds eat so much that it requires a great deal of time and attention to feed them. But of all the owls, the little screech-owl is the most interesting and the least trouble, since it will not attack grown poultry if given freedom to fly about the premises.

The fubsy screech-owl fledglings usually climb out of the home nest hole, about the last of May, and they are the quaintest little creatures imaginable. It is at this age that one may be captured, and will make an interesting though always a snappy pet.

HOUSE

If kept in a cage, the latter should be dry, airy, and easily cleaned, but it is better to give the bird freedom. A large branch, or a section of a small log should be hollowed out, leaving an entrance at the side large enough to admit the bird. This should be fastened in an evergreen tree, situated as near the barn as possible. Introduce the bird into this nest and feed it there every day, and it will soon accept the place as home. It will serve to keep the barn free from mice quite as effectually as a cat. Unfortunately the owl is not discriminating in its food, and is as likely to take the beneficial swallow as it is to take the disagreeable English sparrow, in fact, if one wishes to coax birds to live about his premises, it is not advisable to keep a pet owl. If one wishes to keep a pet owl at home and harmless, one wing should be clipped.

FOOD

The owls like raw animal food, such as rats, mice, insects and heads and necks of poultry. The process of throwing up the undigestible portions from the stomach seems to be so necessary, that some people purchase cheap meat and roll it in feathers or short hair before giving it. The food should be given regularly, and the dietary should not include tough meat.

CARE

A supply of fresh water in a large shallow vessel should always be at the owl's disposal to satisfy thirst and for bathing. When handling the owl avoid its claws, and it is best to use a cloth or strong gloves to protect the hands, since a wound from the strong claws is likely to be infected with poison germs.

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AUDUBON EDUCATIONAL LEAFLETS, Nos. 12, 14, 22.

THE AZIOLA

"Do you not hear the Aziola cry?
Methinks she must be nigh,"
Said Mary, as we sate
In dusk, ere the stars were lit or candles brought.
And I, who thought
This Aziola was some tedious woman,
Asked, "Who is Aziola?" How elate
I felt to know that it was nothing human,
No mockery of myself to fear and hate!
And Mary saw my soul,
And laughed and said, "Disquiet yourself not;
'Tis nothing but a little downy owl."

Sad Aziola! many an eventide
Thy music I had heard
By wood and stream, meadow and mountain-side
And fields and marshes wide,—
Such as no voice nor lute nor wind nor bird
The soul ever stirred;
Unlike and far sweeter than they all.
Sad Aziola! from that moment I
Loved thee and thy sad cry. —*Percy B. Shelley.*

PIGEONS

THE Pigeons are among the most ancient of domesticated birds. We can imagine the children of the Bible—Samuel, David, or maybe Cain and Abel, playing with these beautiful birds and feeding them, just as the traveler sees the little long-gowned boys of the Orient doing to-day. The taming of the pigeon, and the breeding of different varieties, began so long ago, that we have no record of it. Charles Darwin believed that the Rock-pigeon of Europe was the ancestor of our common domestic varieties. These blue Rock-pigeons build in rocky caverns along the coast of the British Isles, and of Europe and Asia bordering the Mediterranean. In color they are scarcely distinguishable from common tame pigeons. Pigeon breeders have never been able to produce a distinct type like the Pouter from this species, although their records cover two hundred years. However, there are other authorities who believe that the stock-dove of Europe was the original species. In all probability, the pigeons, like the dogs, were derived from various wild ancestors. The ancestors of our domestic varieties were probably not migratory, and lived in caverns or trees.

There are to-day about one hundred and fifty varieties of domestic pigeons, including fancy breeds. London is the center of pigeons fanciers, and there the best of the fancy varieties bring large prices. Of these many varieties only four are recognized by fanciers in America as having been bred

Photo by Verne Morton

PET PIGEONS

From Country Life in America

PET PIGEONS, A FAN-TAIL AND A HOMER

to approximate perfection. These royal four are Carrier, Pouter, Barb and the short-faced Tumbler.

Secondly, there are varieties which possess distinctive qualities regardless of color, and have a strong tendency to transmute them to their young; these are Jacobins, Long-faced Tumbler, Owl, Oriental Frill, Turbit, Fantail, Show-Antwerp and Runt.

Thirdly, there are the Toy pigeons, which depends almost entirely upon color to distinguish them from other pigeons, such as the Swallow, Helmet, Nun, Archangel, Magpie and others.

Fourthly, is a bird lacking distinct color or shape, but possessing the instinct of returning home, and an endurance which causes it to rank as a fancy pigeon, this is called the Antwerp or Homer.

SOME PIGEON VARIETIES*

The Carrier does not, as its name would indicate, carry messages, but is kept as a fancy pigeon valued only for shape, size and color. It is a large, strongly built bird, with long feathers and a rough appearance. Its neck is stately, its shoulders broad. At the base of the beak is the Carrier's chief glory, the beak wattle, a bare fleshy growth; around the eye is a bare circle of skin called the eye cere. The Carrier was undoubtedly the pigeon that figured in the Arabian Nights, for it came originally from Bagdad.

The Pouter is a very tall bird, and stands nearly perpendicularly on its long slender legs. It has won its fame by being able while strutting to inflate its breast with air. Its marking consists of a crescent of

*These notes on the breeds of pigeons were written for the author by Professor H. Freeman Button, of Vincennes University, who has had considerable experience in judging pigeons at various shows.

white on the front of its crop. Its other colors may be various. It is a popular pigeon in Europe and Asia.

The Barb is a strong and large bird, with a plump body, short legs, broad skull, and short beak. It has a large thick, circular bright red wattle around each eye. The Barb was a well-known bird in Shakespeare's time, for he alludes to it.

The Short-faced Tumbler was introduced into England two-hundred years ago. It is a diminutive

THE CARRIER

A POUTER

and sprightly bird, with a broad, well-curved head, carried on a graceful neck. The beak is so short and fine that many cannot feed their own young, and they therefore must be cared for by plebian pigeon nurses. When a tumbler flies, it turns very pretty somersaults in the air. Some, called Parlor-Tumblers, can fly but a few feet from the floor, even, tumbling within six inches of the floor, and alighting on their feet. Others are high-flyers, tumbling only occasionally, and are able to remain in the air for hours at a time. The Tumblers have a strong homing instinct.

The Fantail has a broad, expanded tail which may contain as many as fifty feathers. It is a small bird with round body, and full breast, the head being carried so far back that it rests against the tail. The points most sought after in the "Fans" are, small size, large tail evenly balanced, and not carried to one side, and the head carried far back against the tail. The Fantail is thought to have originated in India, and no one knows how long ago.

THE BARB

The Jacobin is a medium sized, plump bird, with a ring of inverted feathers back of the head, which stand up like a feather boa, hiding the head up to the eyes. It is not known in what country the Jacobin originated, but it was mentioned by a writer before the year 1600.

BALDHEAD TUMBLER SHORT-FACED TUMBLER

The Turbit is a small round bird, with full breast and short legs and neck. The head is short and round, the beak very short and stout, and the eye large. The feathers on the back of the head are

inverted, forming a pointed crest, which gives the bird a surprised look. The neck and upper breast have inverted, curled feathers forming a dainty frill. This bird has been known for more than a century.

THE JACOBIN

The Nun has the head and primary wing feathers and tail feathers of the same color, preferably black, and the rest of the body white. It is characterized by a circle of inverted feathers extending from ear to ear, which makes a shell crest about the head, resembling a nun's cap. The bird has been known about one-hundred and fifty years.

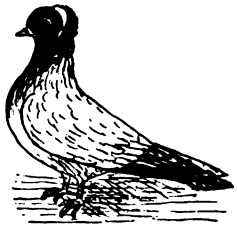
The Archangel was introduced into Europe from Asia about a century ago. The head, neck, breast and under parts are copper bronze, with a sheen of ruby red. The wing coverts and rump are black with green luster, and the tail is dark blue with a black bar at the end.

The Homer or Antwerp does not differ in color or form from the common pigeon, but has such powers of flight, and such success in finding its way home, that it is freely accorded a place as a fancy pigeon. Pigeons have been used to convey news since history began, and probably long before. They were used by all nations in olden times, and often now are used in war to carry messages.

THE TURBIT

The training of the Homer consists in taking a young bird a short distance from home—say ten or

twenty miles, and then liberating it. A second time it is taken some forty or fifty miles away, and thus it is trained in the geography of the home region, until it will return five hundred, or even one thousand miles. It is now thought pigeons travel mostly by sight, using river, lake and mountain as landmarks. The Homer, as we know it, has been developed largely since the siege of Paris, where it was used most successfully to carry news from the unfortunate city.



THE NUN

THE ARCHANGEL

Training pigeons for flight has been a favorite pastime for ages past; At Modena, in Italy, this sport was practiced as far back as 1327. There were men whose business it was to train the pigeons to execute complex manœuvres in the air, directing their performances by loud whistling, and by means of flags. There are also in India breeds of flying pigeons, which are likewise trained and directed by flags fastened to long bamboo rods.

HOUSE

Pigeons are willing to live almost anywhere. The old way was to keep them in cotes, which is a pigeon apartment house placed on a pillar so as to keep it free from attacks of rats and mice. Often they are

housed in the loft of a barn or shed; and while the common breeds do fairly well if thus left to themselves, yet no pets respond to loving care better than do the pigeons.

The first essential of the modern pigeon house is that it shall be mice and rat-proof; this is often accomplished by interlining or covering all the walls with wire netting. The house should be placed on well-drained soil, and should face southward in our northern climate. If built large like our chicken houses, it should be well ventilated with windows that may be opened or closed according to the weather. The roof should be tight, and the holes for exit should be arranged with a six inch alighting board or threshold both inside and outside.

The following pigeon house is advised by Mr. J. C. Long, who maintains that it can be built for twenty dollars, and will accommodate twenty-five pairs of birds. The house is 8 ft. square on the ground plan, 4 ft. high at the back, and 6 ft. high at the front, the roof to pitch from the front backward. The floor is tight, and the whole house is supported on piers or posts a foot high from the ground, and capped with zinc projecting downwards to prevent entrance of rats. The roof may be made of rough boards covered with felt roofing paper, or it may be shingled. In any case, it must be rain-proof. The door for the entrance of the caretaker is placed at one end of the house near the front. Along the front of the house is a window, with eight panes of glass, each pane being 8 x 10 inches. The bottom of the window should be 18 inches above the floor. The window-sill on the inside should be widened by adding a board a foot wide, so the birds may get a sun-bath, which is very necessary to their

health. On either side the window is an exit 6 x 6 inches, with rounded top, and an alighting board 6 inches wide on the outside, and also on the inside of each exit. There should be four rows of nests at the back. The nest compartments should be made of shelves a foot wide and spaced a foot apart. These shelves should be partitioned with narrow boards into spaces a foot wide. The shelves should be removable so that they may be taken out to be cleaned if necessary. The house is really kept much cleaner if nesting bowls are used. These bowls are made for the purpose, and are sold by the makers of floral pottery for green-houses. However, they are necessary only when squab-raising is planned. There should be five rows of nests along the side.

The house completed, we next have to consider the fly, or the gymnasium in front of it. This is not necessary if the pigeons are allowed to fly about the country freely; but it is always a good thing to have in case it is desirable to confine the birds. To prepare the ground for the fly, mark out a space in front of the house 8 feet wide, or just the width of the house, and 14 feet long. Take out all the earth for a depth of 4 inches, and fill the place excavated with clean sand and place at the corners four 2 x 3 inch hemlock posts, 8 feet above ground. These posts should be held in place by 1 x 4 inch boards, nailed to the top and connecting them. One board should be nailed about mid-way the height of the post, and another along the bottom. Space the middle board so that chicken wire 4 feet wide may be used for the bottom section, and that 3 feet wide for the upper section. On the inside of the board, at the middle of the post, should be a walking board 6 inches wide, on which the bird may take exercise.

There should be a wire gate at the side and of course the fly should be covered with chicken wire.

When all is ready, the inside of the house should be thoroughly whitewashed with lime, to which carbolic acid is added in proportion of one teaspoonful of acid to two gallons of wash. Then the floor should be covered with sand; if sand is not to be had, sawdust or chaff may be used.

FOOD

The food should be of good quality. Red wheat, small Canada peas, buckwheat, hulled oats, Kaffir corn, millet, are all used; and as a treat, a little hemp or rape seed may be given. Neither barley or rye should be fed. The grain should not be new, and should be thoroughly dried. Large kerneled corn is likely to choke the birds. Some advise the use of stale bread soaked in water until soft, and then add bran until the moisture is absorbed, and then add a little cayenne pepper; this is used for a relish. In the winter in our northern climates, the Kaffir corn, buckwheat and peas should make up the bulk of the food. The pigeons are always fond of a little tender green food; lettuce or onion tops may be given at any time. If fed only twice per day, the food should be placed in hoppers, rather than scattered on the ground. To make a feed hopper take two boards 2 feet long, 12 inches wide, and one-half inch thick, take two pieces 10 inches wide at the top, and two inches wide at the bottom, and nail them at the ends of the boards. This will make a v-shaped trough with a two inch slit at the bottom. Place below this a trough 6 inches wide and 2 inches deep, with standards at the ends. Fasten the hopper above

the trough with its narrow bottom about 1½ inches above the bottom of the trough. The hopper should have a hinged cover, to prevent the wasting of the food. Wires about two inches apart should extend from the edge of the trough to the sides of the hopper. Food may be placed in this hopper and it will fall below into the trough as fast as it is eaten out.

Several of these filled hoppers and troughs should be placed where the pigeons have access to them. Care should be taken that mice do not get into the food; placing the hopper upon the platforms 4 to 6 inches square, supported on zinc-covered posts is one way to accomplish this.

It is necessary for the health of the birds to give them plenty of salt; often a piece of dried codfish is tacked to the wall, but more often a lump of rock salt which is moistened occasionally, is placed near the food troughs.

Gravel is necessary to the digestion of pigeons; if they are allowed to fly freely they will get it for themselves, but in confinement we must supply this need. Crushed oyster shells, mixed with coarse sand, and some charcoal, seems often more acceptable to the birds than the gravel.

NESTING

At this time coarse hay should be placed where the birds may get it. This should be cut in pieces about 4 inches long. Stems of tobacco, cut about the same length should also be given, to assist in warding off lice. The hen pigeon lays two eggs, usually with one day between. She sits from three or four o'clock in the afternoon until about ten the

next day. Then her mate takes his turn, and sits until afternoon. The period of incubation is seventeen days from the laying of the first egg. The parents are very devoted during this period, and remain near each other excepting when gathering food.

The little squab chips its own way out of its shell. It is covered with yellow down, and is blind and by no means pretty. The parents begin to feed the squabs about three or four hours after they are hatched. To meet this need the stomachs of both parents produce a cheesey substance known as pigeon milk. The parent takes the beak of the young bird in its own, and pumps into the stomach of the youngster this very nutritious food. After about five days, this food is replaced by grain, which is softened in the stomach of the parent. The squabs do not grow much until they are about five days old; when seven days old the pin-feathers appear. When three weeks old the squab can walk, but is not able to feed itself until it is five weeks old.

CARE

The pigeon drinks differently from other birds. It has throat muscles so that it can thrust its beak down into the water, and suck it up, as does the horse, while other birds take a mouthful of the water, and lift the head and let gravity carry it to the stomach. Pigeons must have plenty of clean water. If they are allowed their liberty they usually find this in some pond or stream, but in confinement fresh water in shallow zinc pans should be given twice a day. The best arrangement of all is to pipe the water into the fly, so that it constantly drips

into a shallow pan, which is drained at a certain height. Some advise keeping pieces of iron in the pan. When the pigeons are working hard, during the breeding season, and seem run-down, the Douglass mixture is put in the drinking water occasionally. This is a tonic, and is often very beneficial. It is made by dissolving in two quarts of soft hot water, one-third ounce of sulphuric acid and five-eights ounce of green vitriol. When cold, add two quarts more of water, and place in a bottle or stone jug. Use one tablespoonful of this mixture to one pint of water given to the pigeons for drink.

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DADDY DARWIN'S DOVECOTE, *Mrs. Ewing.*

"I HAD A DOVE"

I had a dove, and the sweet dove died;
And I have thought it died of grieving;
O, what could it grieve for? Its feet were tied
With a ribbon thread of my own hand's weaving.
Sweet little red feet! why should you die?
Why would you leave me, sweet bird! Why?
You lived alone in the forest tree:
Why, pretty thing! would you not live with me?
I kissed you oft and gave you white peas;
Why not live sweetly, as in the green trees?

John Keats.

CHICKENS

DOWNY little chickens make very devoted pets. I once knew a gentleman whose home was in the country who always made pets of his chickens; and in the summer when he sat smoking on the piazza, the chickens would gather in a circle about him, and whenever he went walking across the fields, they would follow him in a long procession.

Chickens do best if allowed their freedom. If this is not always possible, they should at least have the advantage of a good sized yard in which to take their exercise.

The chicken, when it is first hatched from the egg, is a fluffy little creature with bright, questioning eyes, and is so active that it very soon is able to follow its clucking mother into the field and there take the food which she finds for it. The conversation of chickens is particularly interesting, and should be understood by everyone who cares for them. The hen clucks when she is leading her chickens out for food, so that they will know where she is, even if she is hidden in the tall grass, and the chicks keep up a constant peeping so that she knows where they are; if a chick gets lost its peep becomes loud and complaining; but when it cuddles under its mother's wing, its little note is one of utter contentment. Scientists have discovered that there are twenty-three different notes made by the chickens and their parents, and at least ten of these are easily understood by us.

From Country Life in America

IT'S A QUEER WORLD WE HAVE BEEN HATCHED INTO!

Photo by Verne Morton

A FRIENDLY BIDDY AND HER MASTER

The chicken's feet are fitted for scratching, because it finds much of its food on or in the ground. Its beak is sharp and horny, and fitted for picking up seeds and insects. For this reason it is best for the chicken to scratch about in the dirt, and live as naturally as possible.

HOUSE

The coop should be warm, clean and well ventilated. It should contain low perches, for when the chicken is no longer protected by its brooding mother, it naturally goes to roost at night. The perches should be movable so that they can be taken out and cleaned. The coop should have windows, which may be covered with muslin instead of glass, as this will admit the air and prevent a draft. The house should be constructed so that it may be cleaned often. When the chicken is small, the bed must be of finely cut straw or chaff, and must always be dry. Later rye straw may be used. Clean and dry quarters are absolutely necessary for the health of the chicken.

FOOD

A young chicken should not be fed until at least twenty-four hours after it comes from the egg, for it is provided with food by the yolk which it is then absorbing. For the first meal, bread-crumbs moistened with sweet milk is recommended. Hard boiled egg minced fine and mixed with an equal amount of bread-crumbs forms an excellent food for the first day. After that, give oatmeal, or rolled oats, cracked wheat and cracked corn, with a little millet. Grit is necessary to help the chicken digest its food. We chew our food until it is soft and fine before

swallowing; but the chicken swallows its food whole, and after it is softened by juices from the stomach, it passes into a little mill called the gizzard, in which the gravel or grit helps in grinding the food fine. Small, finely broken eggshells may be used instead of grit at first. The chickens must also have fresh green food. If they are where they can get fresh grass this will suffice, otherwise they should have lettuce, or other vegetable tops cut rather fine. Professor James E. Rice gives small chickens chopped onions for green food with the best of results. They should be fed from five to seven times per day for the first week; after this it will not be necessary to feed more than three times a day, if they have constant access to some dry food. The following are rations recommended for young chickens by the Cornell University Poultry Department:

Mixture No. 1	Lbs.
Rolled oats	8
Bread-crumbs or cracker waste	8
Sifted beef scrap (best grade)	2
Bone meal	1

Mixture No. 2	
Wheat (cracked)	3
Cracked corn (fine)	2
Pinhead meal	1

Mixture No. 3	
Wheat bran	3
Corn meal	3
Wheat middlings	3
Beef scrap (best grade)	3
Bone meal	1

Mixture No. 1 should be moistened with sour skimmed milk and will prove a most satisfactory food for the first five or six days. Mixture No. 3

From Handbook of Nature-Study

PLAYING HORSE

Photo by Verne Morton

A PET ROOSTER

is best fed as a dry mash in a hopper and is suitable food to keep constantly before the chicks until they are pretty well grown. Mixture No. 2 is suitable for feeding in light litter after the first week.

CARE

Chickens should have access continually to pure, clean water. Perhaps the easiest way to accomplish this is to fill a milk bottle, or a quart Mason jar to the very brim with water, and invert it in a little pan or saucer. The water should be changed in this every day and the saucer cleaned. By this arrangement water only comes into the saucer for drinking purposes, and the chickens do not get wet, as when a pan of water is given them. Watch the water dish in the winter, and see that it does not become frozen. It is absolutely necessary that the chickens take a great deal of exercise, and this should be in a dry place. A movable coop with a run, which may be made by fastening chicken wire above and along the sides of a framework of two-inch material, works well. In this case the coop itself and the runway may be moved about to fresh ground. The food for little chickens should be thrown into the litter, so as to teach them to scratch for it, and thus be sure that they will take exercise. A dust bath is necessary for the health of the chickens. This is best made of equal parts of land plaster and coal ashes. Fine dust from the road is good. Dust should be kept in a dry portion of the yard in boxes, so that it will not become too much scattered.

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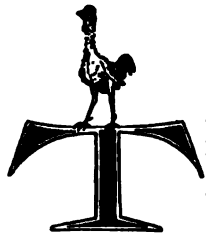

BANTAMS

THERE was once only one kind of bantam. If we should ask our grandparents what they knew about bantams in their childhood, they would tell us many stories of the "Banties" which were their pets; they were reddish in color with tufted legs, and with tails so up in the air that they almost touched the neck, and were possessed of a fighting spirit big enough for an ostrich. In fact, these "Banties" usually were kept apart from the other poultry because the little rooster had so much more valor than judgment that he did not hesitate to attack a Shanghai cock, and would fight until he had not strength enough left to peck. Those Bantams were probably of the original race which were shipped to Europe it is said, from Bantam, in the west of the Island of Java. But Mrs. Skidmore assures us that in Bantam they have fowls so tall that they can take food off the dinner table standing and that the spirited little fowls called Bantams were introduced into Java from a trading junk probably from Japan or China. But strange to say, this breed is practically lost, although it was once well scattered over Europe and America.

The Bantams we have to-day are pigmies of large fowls for the most part, bred true to color and form in many instances. Smallness in a Bantam is a desirable quality. The Standard of Perfection recognizes eight or nine game Bantams, and about eighteen ornamental varieties. While the keeping of Bantams for eggs is scarcely possible so far as markets

are concerned, yet the home table may thus be provided with small and excellent eggs. The females of most breeds of Bantams are good sitters and rear their chicks well, and are often used for hatching pheasants' eggs.

HOUSE

The coop should be made with a tight floor. Many cover the floor to a depth of several inches with sand and scatter over this a layer of chaff, cut hay, or any kind of dry litter. The coop should be well ventilated, with windows covered with muslin sheeting. If it is impossible to allow the fowls to run about freely, they should have a run enclosed in chicken wire. They should have plenty of fresh air, and their quarters be kept extremely clean.

FOOD

Chopped hard boiled egg and bread-crumbs or table-scraps minced fine make an excellent meal for Bantam chicks, later give small rations as advised for chickens. Cracked corn may be given in the winter and hemp seed is always relished. Green food should always be provided; cabbage, turnips cut in small pieces, and mangel-wurzel beets may be given in the winter. In the summer the fowls can forage for themselves, if left free. If confined to coop and run, they should be given a half ounce per day per fowl of finely ground, green bone, or meat scraps in addition to their other food.

Give the same care as given to ordinary chickens

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PHEASANTS

THESE birds did not originate in England. We should need to go to the mountains of Asia Minor if we were to seek the common English pheasant in its native home. Here we should find mountain slopes covered with forests of cedar, oak, walnut, cypress, and many trees which we do not know at all; and even the trees we do know would look strange to us because vines with luxurious foliage and brilliant flowers would be clambering over them. From these wooded slopes we might see below us the fertile valleys where villages were nestled among orange, lemon, peach and quince trees.

In such natural surroundings as these, the pheasant needs to be a brilliant and beautiful bird to fit its environment. Its head and neck of peacock-blue, its scarlet cheeks, and orange and coppery plumage, matches the foliage under which it hides during the day. The beauty of this pheasant was appreciated early, for it has been bred in domestication at least 1600 years. The Romans are said to have taken these birds with them during their invasion and conquest of England, and there established them in the English forests. In southern Europe this pheasant takes care of itself very well; but in northern Europe and England it needs care and feeding in the winter.

In the wild state, the birds live separately except during the breeding season. Then the father bird, very proud of his beautiful feathers, wins by his beauty several wives, and with them forms a band for

Photo by Verne Morton

FINDING A PHEASANT'S NEST

Courtesy of Doubleday, Page & Co.

PHEASANT CHICKS

offense and defense. They occupy a certain territory upon which no other pheasants are allowed to intrude. The cock pheasant is a fierce fighter, and by his cunning tactics can defeat a bird much larger than himself. When fighting with a rooster, for instance, he will fight fiercely for a few moments, then fly up into a tree and take a little rest, and then dash down again upon his bewildered adversary.

In a wild state the pheasant mother makes her rude nest of leaves and grass upon the ground, and there lays about a dozen eggs, which are olive brown in color. She is a patient sitter, and vigilant in protecting her nest; but when domesticated she is likely to shirk her responsibilities, and usually the eggs are hatched by hens, especially by the motherly little Bantams.

The wild pheasants roost in trees nights, and hide in the under-brush during the daytime, coming forth into the fields in the evening to feed. Their food consists largely of insects, grain, seeds, acorns and fresh herbage, like young clover. These birds only take flight when hard-pressed.

Although the pheasant, described above, was the original species introduced into Europe, another species has been interbred with it, until it is difficult to secure a pure blooded English bird.

This is another popular pheasant, the Ring-neck species, which is a native of China, and Eastern Siberia and has been bred there in captivity for centuries. It resembles the English bird, except that it has a white ring encircling the neck. The Ring-neck pheasant was brought into Oregon about thirty years ago, and was strongly protected for ten years; it has now become thoroughly established there.

The bird which we call the English pheasant, which the National Government and several of our States have introduced into America, is a bird of the mixed English and Ring-necked species. It has now become established in Massachusetts, Ohio, Indiana, Illinois, New Jersey, New York, Vermont, Pennsylvania and Kansas.

There are some beautiful species of pheasants, fitted for life in an aviary, although they may not be trusted to look after themselves. The best of these for a beginner are the Golden and Silver pheasants. The cocks of the Golden pheasants have a luxuriant crest, their colors are brilliant and dull yellow above and scarlet below. The Silver pheasant is well-named, for the feathers of its back are white striped with black; its crest, throat and under parts are purplish black. The young of both of these species are hardy and easily reared.

Mr. Homer Davenport had 38 species of pheasants which he succeeded in keeping successfully on his New Jersey farm. Many of them were the Reeves species, which is a native of the mountains of China. The Reeves cocks are rich yellow and black in color, and often measure seven feet from beak to tip of tail.

The most wonderful of all the pheasants is probably the famed Argus species from the Malay Peninsula and Sumatra; the cock has the secondary quills in the wings developed immensely, even to two feet in length; each one of these is striped and spotted in leopard pattern, with as many as seventeen eye-spots along the outside of the quill. When the wings are closed the eye-spots do not show. Mr. Davenport noted that when this bird goes wooing he elevates his wonderful wings and spreads them wide, like a great fan, in front of his lady-love,

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ENGLISH PHEASANTS

Photo by Verne Morton

SILVER PHEASANTS

meanwhile he hides his head coyly behind the right one, sometimes peeping out between the flight-feathers to see if he is making an impression. This pheasant barks like a dog.

HOUSE

Although pheasants when grown should be given freedom in the fields, it is necessary to house and care for them during the breeding season.

The house should be put on well-drained ground, and on a gentle slope facing south but where it will be comparatively cool in mid-summer. Sandy loam is the best soil, and clay the poorest for the pheasant pen. Each pen should cover at least one hundred feet square, and it should be from six to eight feet high, and enclosed above with wire. If only one cock and four or five hens are kept, the pen need not be larger than thirty feet square. A small open shed should be placed at the upper side of the pen for a shelter in wet or stormy weather. The floor of this shed should be natural soil, so as to furnish dust baths for the birds; for it is absolutely necessary for their health that they be able to dust themselves. Mortar, cinders and plenty of grit should be kept in the shed. Wire netting should be set down into the ground for about two feet to shut out burrowing animals that prey upon the birds. There should be perches in the shed and also in the open pen. Both sheds and pens should be kept very clean. The earth of each pen should be spaded and limed every two or three years, and the pen may be sowed with clover and grass to provide the green food

FOOD

Pheasants are light feeders, and should not be over-fed. To guard against the over-feeding, sprinkle a little food on the ground and wait for that to be eaten; repeat this until the birds lose interest, then do not give any more. In this way may be estimated how much the birds really need. Wheat, buckwheat, Kaffir corn, a few oats and a little barley may be fed. During the winter a little hemp seed and cracked corn may be given. When in good condition in the summer, the birds should be fasted every other day; during the breeding and laying season the birds should be fed twice a day a mixture of alfalfa meal, middlings, meat scrap, a little corn meal and a little bran. A very good substitute for this is Spratt's patent game food. Green food must be given each day, unless there is plenty of grass in the aviary. Cabbage, lettuce, small rape and beet roots may be suspended about the pens. Lawn mowings may be thrown in, or finely chopped onion tops, beet leaves or other succulent green food. The dishes in which the food is placed should be scalded, and plenty of fresh water must be furnished daily. A trough of running water is the most desirable arrangement, otherwise the drinking trough must be cleaned and replenished each day.

CARE

The same person should take care of the pheasants each day, and should wear the same clothes, for the pheasants are timid birds, and it is not desirable that they should be frightened. When the hens are laying, the eggs should be gathered every day, and placed in bran, and should be set as soon as possible.

They will not hatch after more than two weeks old, and they must be turned daily. The eggs should be hatched by hens, preferably Bantams. The young chicks must be kept with their mother in a special pen, which must be kept very clean and dry. They should be fed first on hard boiled egg, grated fine and mixed with browned bread crumbs, cracked wheat, finely cut onion tops or lettuce. Canary, millet or hemp seed may be added for variety. After two or three weeks the following is a good ration:

1 quart of milk
1 " of bone flour
2 " of corn meal.
2 " of wheat middlings
1 pint of beef scrap ground fine

After three weeks the coarser ground food may be given until the fifth week, when the grains given the adults may be fed. The chicks should not be fed for twenty-four hours after hatching, and then should be fed every two hours for the first and second weeks, every three hours for the third week, and every four hours until about the tenth week.

The Ring-neck and English species require 24 days, the Golden-pheasant only twenty-two or three days, and the Silver species twenty-seven or eight days, for incubating.

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THE QUAIL, BOBWHITE

THE boy so fortunate as to live in the country should have a flock of pet quail. These are most interesting and valuable little birds, and with kind treatment and care during the winter season they become so tame that they will stay on the farm like poultry.

The Bobwhite likes open fields, with brushy fence-corners, or other low bushes near at hand for protection from storm, and enemies. In the matter of their food, quail are wholly beneficial to the farmer; in the spring and summer they feed upon insects, and in the fall and winter on the seeds of weeds and waste grain. The pretty song—"Bobwhite," or "More-wet," or "Buckwheat," variously translated, is the courting note of the male. He sends it out over the fields from some fence post, or other high point, and the song is appreciated by the little quail hen hiding in the grass, and soon the pair set up housekeeping. The nest is made upon the ground, under a bunch of grass, or some bush, especially a briery one. It is a rather simple nest made of grasses, and in it are laid from ten to eighteen pure white eggs, very pointed at the small end. The father quail helps the mother in the incubation. In about twenty-four days the young quails hatch; they are fluffy little things, and after a day or two are quite able to follow their parents about in quest of food. They are obedient creatures,—the moment the mother gives a warning note that the enemy is near, they lie flat, hidden among the grass and

From Country Life in America

A FLOCK OF TAME QUAIL

From Country Life in America

A QUAIL CHICK

leaves, and never wink an eyelid or stir a foot until the danger is past.

The family remains together until the following spring, and it is very delightful to see them get ready for bed They gather in a little circle, each one facing outward, so as to be able to detect the enemy in any direction; and when the enemy is upon them, each springs in the direction towards which it is faced, and flies off swiftly. Thus it is that the enemy, however cunning, rarely gets more than one of the family at a time.

The quail have a hard time in the winters, and usually spring finds but few of the family left in our northern countries. Their enemies are, especially, cats, dogs, the Cooper and the Sharp-shinned hawk, and the Goshawk.

CARE

If in a city or town, the quail may be kept in a large wire coop, which should include a convenient drinking and bathing place. If an attempt is made to establish the quail on a farm, we must first get rid of all stray cats; we must provide a field in which there are clumps of sumac, wild-rose, blackberry bushes, or young pine woods. The ideal shelter, with food combined, is made by laying down upon the ground for several yards square, first a pile of weeds and chaff, or hayloft sweepings; over this should be placed a layer of stiff brush; and over all should be piled a layer of coarse weeds, cut before the seeds drop; these may be rag-weed, pig-weed, dock, wild-sunflower and the like. The brush should be left exposed on the south side. Fresh supplies of screenings should be thrown into the brush at frequent intervals during the winter.

In case the quail live naturally upon the farm, they may be encouraged by winter feeding. There should be a regular feeding place near the house or barn, a place protected by brush is the best.

Quail like almost any kind of grain. It is a good plan to plant buckwheat in the late fall in a field near the Bobwhite coverts, so as to give an abundance of food to the young birds.

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THE BOY AND BOBWHITE

"Dear little Bobwhite, where do you live?"
"At the edge of the wood where it borders the wheat.
I eat all the weed seeds and my energies give
To helping the farmers, who pay in deceit
And shoot me to death,—my dear chicks they eat."

"Dear little Bobwhite, where do you sleep?"
"Down there in the fence-corner close to the hay.
My wife and chicks seven so cosily peep
As we nestle together, heads pointing away
To watch for the foe, come whence he may."

"Dear little Bobwhite, I'll care for you *good*;
I will make you a brush pile where blackberries grow,
I will feed you and all of your quaint little brood,
With buckwheat and screenings spread over the snow,
And I'll chase off the cats and every fierce foe."

From Country Life in America

A PEACOCK IN ALL HIS GLORY

From Country Life in America

A WHITE PEACOCK

THE PEACOCK

PERHAPS you like Kipling's Jungle stories and have read in the wonderful story of Tomai of the Elephants, the following:

"What little Tomai liked was to scramble up the bridle paths that only an elephant could take; a dip into the valley below; the glimpses of the wild elephants browsing miles away; the rush of the frightened pig and peacock under Kala Nag's feet."

—*Tomai of the Elephants*, RUDYARD KIPLING.

Thus we see that Tomai saw the peacock as a wild bird, and if we should see it thus, and study its habits, we too must go to those jungles of India which border on streams; for the peacock is a thirsty bird, and must always live near water, and with enough cover to protect it from the rays of the hot sun. It also likes to be near cultivated land, where it often becomes a nuisance, because of its love for the ripening grains.

At the breeding season the peacock is a bird of much responsibility, for he has several families to look after, usually having four or five admiring wives. The peahen chooses a bank above the common level, and there upon the ground builds her nest of leaves and small sticks. She lays about a dozen or fifteen eggs and sits on them very steadily. The eggs hatch usually about the first of November, and the chicks feed upon the young grain, and become so juicy and tender that they are often hunted for food.

The jackals, wild cats and tigers are the especial enemies of the peafowls in their native home. If

he sees any of these enemies the peacock will give a peculiar hoarse cry, and all of his fellows within range of the sound will answer, and all of them will fly into the trees out of harm's way. The tiger hunters in India know this note of the peacock, and often thus discover the dreaded beast's hiding place. Although in the wild state the peafowls nest on the ground, they always roost in trees. Their native food consists of land snails, lizards, small frogs and insects of all kinds. They feed to some extent upon lush grass and buds, but prefer grain to all else.

The peacock's glorious plumage is merely a matter of pleasing and attracting to himself his wives, and so he is arrayed in his gorgeous feathers only from June to December, when they are shed. They are ordinarily called tail feathers, but they are really the feathers of the tail coverts, which grow out so long as to completely hide the tail. Even one of these wonderful feathers is worthy the study of an artist, so exquisite is it in form and color.

It is because of his beautiful plumage that the peacock became early associated with man, and was a domesticated bird in the time of Solomon. Alexander brought it to Greece when he returned from his expedition to India more than 300 years B. C. From Greece it was taken to Rome. During ancient times the peacock appeared in royal parades, and its feathers decorated thrones and shrines. It was considered the bird of Juno by the Greeks and Romans. The early Christians rejected the heathen goddess but retained the bird as an emblem of the glorified body. In the days of Rome's degeneracy, the brains and tongues of these birds were served at feasts.

The white peacock, and those that are pied, are sports of the common species. However, there is another species found in Java which is called the green Java peafowl, since its feathers are green instead of blue. It also has a crest of feathers that have barbs for the entire length, instead of the fan-shaped crest feathers of the common species, which have the naked quill below. These Java fowls are really the more beautiful birds, especially since the hen is almost as gorgeous as the cock. There is also a black-winged species from Cochin China, which is called the Japan peafowl. In this species the male is the darkest of all the peacocks, while the hen is almost white.

HOUSE

Peafowls will roost out of doors the year round, but they should be provided with a shed in which to retire, and of course this should be fitted with perches. It is rather difficult to keep them with other fowls, since the male is likely to kill the chicks, and indeed, is a very disagreeable member of the poultry yard. A peacock and four hens should be kept together, and apart from the other poultry; as a matter of fact, the males live peaceably with each other, so that several of them may be kept in the same yard. They are hard to confine in an enclosure, for even with clipped wings, they can manage to get over a six-foot fence. The peafowls do better when they are allowed to wander far and wide, for they have never become fully domesticated despite their long association with man. They resemble turkeys in their habits and they will thrive on the treatment given to turkeys.

FOOD

The peafowls should be fed the same as pheasants. They may also be given scraps from the table. The pea-chicks should be given more animal food than ordinary chickens. Even if allowed to range over the fields with the mother, the chicks should be fed at least once a day.

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THE PEACOCK

Amy's home was in the city.
  Every June she was a guest
Of her dearest Auntie Mary,
  On a large farm in the West.

Amy loved the pigs and chickens,
  And oft in the barnyard played.
One day the peacock trailed his plumes
  Near to the little maid.

And then he spread his splendid tail
  And strutted round about.
"Oh, Auntie, see," cried Amy,
" The old hen blossomed out!"

From Country Life in America

CANADIAN OR WILD GEESE

Courtesy of Doubleday, Page & Co.

A LITTLE GOOSE GIRL AND HER FLOCK OF CHINESE GEESE

THE GOOSE

THE goose was a common pet in ancient Greece, where objects of beauty were much prized. On Grecian tombs are figures carved in relief of the dead boy or girl in company with a pet goose; so much was this pet loved that it was made the child's companion even in death; and, indeed, there is no bird which is more interesting as a pet than the goose, because of its great intelligence. No other denizen of the farmyard learns obedience so readily as the goose. It obeys quickly and perfectly the spoken word of its master or mistress, and a pet goose is as devoted and as affectionate as a dog. In one instance known to Miss Ada Georgia, a little boy had a pet gander that would obey his every command, and would never willingly let his little master out of sight. If a playmate attacked the boy, the gander would rush to his rescue, and whip his assailant with his wings. Once when the boy was ill in bed, the gander wandered about disconsolately honking, and refused to eat; he was then taken to the side of the house where the sick room was situated, and where his beloved master could look at him from the window, and he immediately became contented; he now ate his food, but refused to leave his post beneath the window until the boy was well.

Wild geese have interesting habits, which are well illustrated by those of the Canada goose. This bird is a superb creature, brown above and gray beneath, with head, neck, tail, bill and feet of black; and as if to emphasize this black ornamentation, there is a white crescent-shaped "bib," extending

from just back of the eyes underneath the head. These geese nest at the far North, and spend the winters in the South. There is no more interesting sight anywhere in the autumn landscape than the wedge-shaped flock of these long-necked birds with their leader at the front angle. The honking which reveals the passing flock, before our eyes can discern the birds against the sky, is the call of the wise old gander leader to those following him, and their return salute. He knows his way on this thousand-mile journey by the looks of the country. If a fog or storm hides the earth from his view, he is likely to become confused, and the flock will drop to earth with many distressful cries. The migration northward takes place in April and May, and the southward migration from October to December. The journey is made with stops for rest and refreshment, usually in secluded ponds or lakes. The food of wild geese consists of water-plants, seeds and corn, and some small animals living in water. The nests made of sticks, are lined with down, and are usually on the ground along the shores of streams; they are sometimes built on tree-stumps. There are only four or five eggs laid, and both parents are devoted to the young, the gander bravely defending his nest and family from the attacks of enemies.

Our domestic geese are naturally monogamous in habits, and loyal to their mates. Old fashioned people declare that they choose their mates on Saint Valentine's Day, but this is probably a pretty myth; when once mated, the two live together year after year until one dies; an interesting instance of this is one of the traditions in my own family. A fine pair of geese belonging to my pioneer grandfather had mated for several years and had reared

handsome families; but one spring a conceited young gander fell in love with the old goose; and as he was young and lusty, he whipped her legitimate lord and master and triumphantly carried her away, although she was manifestly disgusted with this change in her domestic fortunes. The old gander sulked and refused to be comforted by the company of any young goose whatever. Later the old pair disappeared from the farmyard and the upstart gander was left wifeless. It was inferred that the old couple had run away with each other into the encompassing wilderness and much sympathy was felt for them because of this sacrifice of their lives for loyalty. However, this was misplaced sentiment, for later in the summer the happy pair was discovered in a distant "slashing" with a fine family of goslings and were all brought home in triumph. The old gander, while not able to cope with his rival, was still able to trounce any of the animal marauders which approached his home and family.

The goose lines her nest with down and the soft feathers which she plucks from her breast. The gander is very devoted to his goose while she is setting; he talks to her in gentle tones and is fierce in her defence. The eggs are about twice as large as those of the hen and have the ends more rounded. The period of incubation is about four weeks. The goslings are beautiful little creatures, covered with soft down, and with large, bright eyes. The parents give them most careful attention from the first.

The gander and goose always show suspicion and resentment by opening the mouth wide, emitting a hissing noise, and showing the whole round tongue in mocking defiance. When the gander attacks, he thrusts his head forward, even with or below the

level of his back, and seizes his victim firmly with his hard-toothed bill so that it cannot get away, and then with his strong wings beats the life out of it. I remember vividly a whipping which a gander gave me when I was a child, holding me fast by my blouse while he laid on the blows.

Geese feed much more largely upon land plants than do ducks; a good growth of clover and grass make excellent pasture for them; they feed upon water plants but do not eat aquatic insects and animals to any extent. The goose is long-lived, it often being profitably kept until twenty-five years old. There are recorded instances of geese having reached the age of fifty years, and one authentic instance is given of a goose which was the property of one family for 101 years, and was then killed by the kick of a horse.

In Europe the geese are driven to market in large flocks; there may be several hundreds in a flock, and they will remain in good condition if driven eight miles per day.

There are seven varieties of geese used commonly as domestic fowls: The Toulouse, which is grey; the Embden, which is white; the African, which has beak and knob black, the head black and the body dark grey; the Brown Chinese, which are brown in color, and have the knob and bill dark brown or black; the White Chinese, which are white with the knob and beak orange; the Egyptian, which are gray and black, with purple or bluish red beak and orange eyes, set in a chestnut patch; the wild, or Canadian geese are also domesticated.

HOUSE

The house may be as small and as inexpensive a coop as will give shelter from storm and predatory animals; but it should be large enough to give plenty of air, and should be well ventilated, and should be placed where the geese can have access to pasturage and to water. They are very fond of grazing, and are particularly good for weed-infested land. To make them happy, they should have constant access to a pond or stream; although they can live away from water, it is not natural for them to do so. At least they must have plenty of fresh water to drink each day.

FOOD

Geese should be given plenty of grass in their pasture. Cooked vegetables may be fed in the form of a mash. An excellent mixture consists of bran, middlings, and corn meal, with cooked vegetables. Animal meal mixed with moistened corn meal is recommended for young geese. If the geese are allowed to roam they will supply themselves with animal food in the form of insects, snails, etc. If they are not allowed to roam, they should be given animal meal or meat scrap. Goslings should not be given sloppy food. They should be fed four times daily until they are fourteen days old, and after that three times daily. For the first eight days, the food should be stale bread crumbs mixed with a very little corn meal and bran, all slightly moistened so as to be crumbly. Goslings should not be allowed to swim until they have a new coat of feathers, so drinking water must be given them in an inverted bottle, as described for chickens, at first.

CARE

The goose that is laying should be given a quiet and safe nesting place for incubating. From ten to sixteen eggs are laid. The nest should be bedded with oat straw or other short, dry litter. The period of incubation is about thirty days.

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In Quest of Waptonk, the Wild, NORTHERN TRAILS, *W. J. Long.*

The Decoy, in WATCHERS OF THE TRAIL, and The Homesickness of Kehonka, KINDRED OF THE WILD, *C. G. D. Roberts.*

Wild Goose Ways, WHOSE HOME IS THE WILDERNESS, *W. J. Long.*

I hear the wild geese honking
From out the misty night,
A sound of moving armies,
On-sweeping in their might;
The river ice is drifting
Beneath their northward flight.

—*John Burroughs.*

WILD GEESE

November fields are brown below, the tattered clouds are gray,
A stream of sunlight rifting through, as if affrighted fails;
From high above, a leader's call, that thrills the heart this day,
A wild geese V, unequal armed, across the wild sky trails.

From Country Life in America

A PAIR OF MALLARD DUCKS

Photo by Verne Morton

FEEDING THE DUCKLINGS

DUCKS

SPLASHING, waddling ducklings make pretty pets, although they have not the intelligence of geese. Those used merely for pets are the Call, and the East India ducks, which are the bantams in the duck family. The Mallards are very often used for pets because this species is still wild, and therefore, more interesting. The Mallards are beautiful creatures; the drake's head is irridescent green, which matches the broad wing bar, bordered with white. There is a ring of white also about the neck, which contrasts strongly with the chestnut and red breast. The female is also beautiful, but her brown, grey and penciled feathers are fitted to render her quite invisible when on her nest. The young are speckled like their mother.

The wild Mallard is still rather plentiful in America, and may be seen on most of our inland waters during the migrating season. It nests chiefly from Labrador northward. When wild, these ducks are said to pair as do the geese. The nest is built on the ground usually, and rarely in trees. It is made of grass and leaves and other rubbish, and is lined with down which the mother plucks from her own breast. This duck lays from six to twelve pale grey eggs tinged with blue-green. When she leaves the nest, she carefully pulls over the eggs a coverlet of down and leaves. She sits for twenty-eight days; her downy little ducklings start for the water soon after they break through the shell; sometimes the mother has to help them on this journey by carrying

them in her bill. Her devotion to her brood is full of self-sacrifice; it is fully six weeks before the young develop wings to fly, and meanwhile she has many enemies to fight. The mink, otter, large fish, like the pike, and hawks, all prey upon these ducklings. In August and September the families of a region unite and come southward in flocks, where they visit our grassy ponds and sluggish streams, or reedy marshes around lakes, where they feed on the seeds of wild rice and rushes. In the winter they stay from the Chesapeake Bay southward to Central America.

The most beautiful of our wild ducks, which have been domesticated for parks and ponds, is the Wood-duck. Its colors are brilliant and beautiful. It has a bonnet of irridescent purple and green, white throat and chestnut breast spotted with white. Its wings are glossed with purple and green and tipped with white. These birds nest in the United States, and have a most peculiar habit of building their nests in holes in trees, usually taking a hole already made by woodpecker or owl. They can also walk about on the branches of trees, although their feet are webbed. Their note is musical, and not a "quack."

The Mandarin duck is a near relative to the Wood-duck. It lives in eastern Asia. Both the Mandarin and Wood-duck have been domesticated and may be purchased of dealers· but with both of these species it is necessary to consult the tastes of the individuals in mating. It has to be a love-match with these birds, and the two remain paired for life; usually if one is lost the other remains single. If a pair is kept isolated the two will rear their own brood; but they must have opportunity for perching, and

should have nesting boxes placed high up. Their yard should be covered with wire netting, as well as fenced, for these birds can scale a wire fence with perfect ease, and thus escape. Both species are active at night. It is more usual to hatch the eggs of these ducks under a Bantam; if this is done, other eggs should be given to the Wood-duck mother.

HOUSE

Ducks are hardy, but they should be protected from storm. A low shed does very well; the floor should be covered with chaff or shavings. It must be borne in mind that ducks squat upon the ground when resting, and therefore the floor of their shelter must be dry and clean, and should be changed often enough so that it is kept fresh and wholesome. There should be plenty of shade in the yard, and the house itself should be shaded from the hot sun, for the heat is dangerous to ducks, especially to ducklings.

FOOD

The natural food of ducks is largely insects, and all of the animal life that swarms about the aquatic plants in the ponds and still waters in which the ducks live. Thus, if raised where there is a pond which contains much duckweed and other vegetation the birds will not need much other food, in summer, but if kept in an enclosure, the older ducks should be fed grain which has been moistened with water or milk. Plenty of green food, such as rye, clover, alfalfa or corn should be given, but it should first be cut fine in a feed-cutter; this may be fed alone or mixed with the grain. The food should never be placed on the ground where it may be soon

trampled in the dirt, but should always be placed in a shallow feeding trough. It is best, when possible, to change the ducks from one yard to another, and plant the yard just vacated with some quick-growing crop, like rye. If this is not possible, sawdust or sifted coal-ashes should be scattered freely over the most frequented portions of the yard.

Young ducklings should be fed green material as described above, and also wheat bran, corn meal and ground oats, from which the hulls have been removed, moistened with water or milk. From ten to twenty per cent. of animal meal is often added to the ration of the growing ducklings. When the ducklings are first hatched, equal parts of corn meal and wheat-bran, mixed to a crumbly mass with water or milk, should be given every two hours. For the next five weeks they should be fed four times daily. Five per cent grit should be added to the food.

CARE

Cleanliness, although difficult to attain, must be the rule in the duck-yard, and there should be plenty of pure water. Since water is the natural element of ducks, it surely makes them much happier if they have access to ponds or flowing streams.

The duck is an excellent mother. Care must be taken not to allow the small ducklings to become wet or chilled; when small, they must be carefully shut up at night, for there are many creatures that feed upon them.

The duck is a rapid swimmer, and its natural means of progress is either swimming in the water, or flying through the air. To walk on land is unnatural and difficult for the duck, for its legs are

placed far back and wide apart, and the creature is under a constant strain to keep the body balanced when walking. For this reason, ducks should never be chased; they will often fall dead when they are obliged to run rapidly, especially in the summer.

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DUCKS

When first the grass grows green in spring,
And from bare boughs the robins sing,
Before the orioles come back,
I hear the ducks go, "Quack! quack! quack!"

They paddle round and dive and float
Just where I like to sail my boat,
And when I run, from school set free,
They make such funny eyes at me.

They never cry, nor fuss, nor fret,
About the springtime rain and wet,
And have no heed of sheltering roofs
Because they all wear "waterproofs."

—Clinton Scollard.

THE GULL

THE seagull would seem to be a quite impossible pet, and yet there are records of many being kept as such. Usually the pet is a young bird, or an injured one which has been rescued and fed. The gull is naturally gluttonous and fond of its food, and therefore learns soon to greet with pleasure the one who feeds it. It will eat almost anything, and likes especially the leavings from the table, eating greedily the scraps of meat. Although this bird is only beautiful when on the wing, when it is the most graceful and interesting of sea-birds, yet there is something rather attractive about a tame gull waddling about the garden diligently searching for slugs, grubs and mice. It has the advantage of being a very hardy bird, and requires no shelter. The gull has more mind than its looks would imply, and can be trained to a degree of intelligence.

CARE

If there is no pond near at hand, a large shallow tub of water should be provided in which the gull may bathe. The long quills on one wing should be clipped so that it cannot escape by flight. In case a young bird should be captured, it should be fed on raw meat chopped, and on raw fish.

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Photo by G. K. Gilbert

A SEA-GULL

From Country Life in America

A PAIR OF SWANS AND THEIR CYGNETS

SWANS

TO properly appreciate swans we should have lived in the time of Queen Elizabeth, for at that period there were 900 swanneries in England; and each owner of a swannery had his own brand, which was cut into the beaks of the cygnets. The first Monday of August was the date when the Crown, and also the Dyers & Vinters Co. did their branding in the swanneries on the Thames.

There were plenty of swanherds to take care of the birds, and there was a Royal Swanherd who was a great personage in the royal establishment. The first Monday in August must have been exciting, if the catching of the cygnets for branding was as greatly resented by the parent birds as was the case when I simply tried to examine a little more closely the cygnets of a swan family on the Thames one August day not long ago. I shall never forget the fierce aspect of the male swan. He advanced toward me hissing like a snake; his short legs and awkward gait only made his long neck and threatening wings seem more formidable. I quickly informed him, in swan esperanto, that I did not think his smutty down-covered darlings were worth looking at anyway, meanwhile I beat a discreet retreat.

In England, during the reign of Edward IV (1483), the swan was declared a royal bird, and a law was enacted that "No person who did not possess a freehold of a clear yearly rental of five marks" was permitted to keep swans. During the reign of Henry the VII, a year's imprisonment and a fine, at the king's will, was the punishment for stealing a

swan's egg. In very early times the swanherds called the male swan a "cob," and the female a "pen," and the young were called cygnets, as they are today.

The swan was also much prized in ancient times. It was the bird of Apollo, and especially belonged to the muses. Through literature, from the times of the Greeks down to today, we find the story of the song of the swan; how it lifted its graceful neck and poured forth its beautiful melody, its first and last song, and then hid its head beneath its wing and dying, floated away upon the waters. This beautiful story could only have happened in those days when everything was true. The swan's voice is harsh, and its note is a repeated "hoop, hoop, hoop," and it is only musical when heard from afar.

There are less than a dozen species of swans, all told. We have two noble species in America, the Trumpeter and the Whistler. These are both western birds, and breed from the Dakotas northward to the shores of the Arctic Ocean. Both species have a peculiar development of the windpipe, which penetrates the keel of the breast-bone to its hind-portion, and then is bent forward again to the front of this bone before going to the lungs. No wonder that swans can "hoop" with such an apparatus as this. The Whistling swan of Europe is likewise equipped, and the Greeks named it "Ferus," because they thought its voice musical.

In the wild state, swans are great flyers; they fly very high, beyond our sight, and when flying form in two lines which converge to a point occupied by the leader, as do the wild geese. Swans are tremendous swimmers, being able to swim faster than a man can walk.

Although all species of swans have been domesticated, the swan usually seen in our parks is an European species, domesticated for at least 800 years. It is called the Mute swan because it is silent in captivity; but naturalists say that when wild, it trumpets loudly during the breeding season, although it has no special convolution of the windpipe to aid it. The Black swan of Australia is also often seen in parks. The beauty of the swan lies in its long and graceful neck, which includes from twenty-three to twenty-five vertebrae, thus giving it all of the grace of the serpent.

As pets, swans are better to look at than to be familiar with; their attitude is often hostile toward us, and occasionally they persecute all the smaller birds of a pond. I knew one that drove out or killed all the fancy ducks in a park pond.

The male swan is larger than the female, and a pair remain mated for life. At pairing age the male swans fight each other fiercely; each tries to drown his rival by holding his head under water.

The swan builds a nest of straw and twigs, and during the incubating season the setting parent, usually the female, amuses herself by reaching out her long neck and seizing anything that is movable and heaping it up around her, thus walling up her nest until it is as private as an English garden. The nests are thus often six feet across, and two feet high. The eggs are from five to nine, usually seven, in number, and are grayish olive in color. The swan incubates six weeks. The cygnets do not leave the nest for at least twenty-four hours after hatching; then the parents take them to the water. The mother is very tender of her youngsters, and will lower herself under the little creatures

when in the water, so that they may rest on her back, and not become too tired. The father swan will often do this also. Each pair, with its family, owns a certain region, and resents intrusion from other birds and animals. The parents are especially fierce in the defence of the nest and young; they cannot inflict much of a wound with the beak, but they thresh the enemy with their powerful wings. The cygnets are covered with gray down at first; they get their white plumage the second year, and breed the year after. Swans are very long-lived, some specimens are known to have attained the age of fifty years, and there is a current belief that they may live to be eighty or a hundred years old.

The swan has always appealed to the imagination, because of its stately grace and beautiful plumage. It appears often in fairy stories and folk lore, from the Ugly Duckling to Lohengrun. Once young swans were an article of food for luxurious tables. Swansdown, used for boas and for trimming garments is made from the skin of the breast of the swan. Formerly the swan's wing quills were much esteemed for pens.

HOUSE

Swans are hardy. All the protection they need is a small shed, open to the south on the border of a pond. They are decidedly aquatic, and must always have access to the water.

FOOD

The natural food of the swan consists of seeds, leaves and roots of aquatic plants; and if the pond is well stocked with these, the birds will thrive. However, they will do well when kept on grain of

From Country Life in America

A SWAN TURNING HER EGGS

Scene in a swannery

various sorts, which should always be given to them in shallow water. The cuttings from the mowings of the lawn are especially appreciated. We often see the swans in parks feeding upon the grass and clover upon the margins of the ponds. They also relish the animal food which they find in the water, and greedily eat aquatic worms, insects and small fish. When rearing their young they should be given bread or dog-biscuit soaked, and also lettuce. Stale bread thrown in the water is always relished. A mixture of wheat, buckwheat, barley and cracked corn may be given as a regular food. Oats may be used instead of one of the other grains occasionally.

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THE SWAN UP TO DATE

Oh, Swan, you are a living boat,
  Your deep breast is a keel,
To guide you as you swiftly float,
  Driven by your strong webbed heel.

But when I see you lift and fly,
  Your great white wings wide spread,
You seem, as you sail in the sky,
  An aeroplane instead.

Then when I see you circling 'round,
  Back to the waves again,
You slide so gracefully adown,
  You seem a hydroplane.

Fish

AQUARIA

PLENTIFUL are the kinds of aquaria, from those made in jelly glasses and fruit jars, for the caging and rearing of water insects, to the larger aquaria for fishes. The aquarium may be a tank or a glass jar, but it should always have straight sides. The curved sides of the globe do not allow water to come sufficiently in contact with the air. If we have only water in the aquarium, we then need to change it quite often to keep our pets alive. But if we can plant in our aquarium the weeds which grow in ponds, through them, and the oxygen they give off, the water remains pure, and does not need to be replaced. This is called a balanced aquarium.

To make a balanced aquarium we place in our jar, of whatever size or shape, a layer of sand, and from the nearest pond, or quiet pool in a stream, we bring, carefully, in a pail of water, such plants as we find living entirely beneath the surface. We select some of these and plant them in the sand at the bottom of our jar; after they are planted we put a few small stones upon them so as to hold them fast in the sand. Now our aquarium is planted, and we must add the water very gently, by letting it run down the side of the jar so as not to tear up the plants we have just put in place. Such an aquarium

Photo by Verne Morton

GETTING MATERIAL FOR HIS AQUARIUM

should not be kept in the strong sunlight or it will become filled with green slime, which is a low form of vegetation.

Now our aquarium is ready for fish, or any other water creatures, and all the attention it needs is to replace the water as fast as it evaporates.

Many people like to make fancy aquaria by placing in the bottom stones, volcanic rock or sea shells. This can be done according to the owner's taste, but renders the aquarium more difficult to clean.

For cleaning waste matter from the aquarium, we should be provided with a glass dip-tube or pipette of a length to reach to the bottom. A shallow, flat-bottomed dip-net is useful in removing the fish when the aquarium is to be cleaned. This net need not be more than four to six inches across, depending upon the size of the aquarium and fish.

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FISH STORIES, *Holder and Jordan.*
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HALF HOURS WITH FISHES, REPTILES AND BIRDS, *Holder.*
NEIGHBORS WITH WINGS AND FINS, *Johonnot.*

RELIABLE FISH FOODS

Green River Fish and Baby Fish, made by Harry P. Peters, 1210 N. Warusch St., Philadelphia, Pa.

Paullins Hatching Fish Food, composed of 40 per cent. Daphnia and 10 per cent. mosquito larvae, 425 Wolf St., Philadelphia, Pa.

Spratt's Aquarium Fish Food, Spratt's Co., Newark, N. J.

GOLDFISH

ONE of the most interesting journeys imaginable would be to travel in Ancient China where the ancestors of the goldfish in our aquarium lived. For it might take us back into ancient China and along the streams which flow into those magnificent rivers which sweep from the high mountains in eastern China to the great rich plains of the coast. And we should pass strange cities beset with beautiful temples, and we should see Chinese men dressed in their robes of silk, the color of peach blossoms or apple blossoms or blue like the sky or purple as the violets. And we should find playing by the banks of the stream little children dressed in every color of the rainbow, and the little girls might perhaps be toddling about on their tiny bandaged feet.

And if we should find this ancestral fish we would find with it many companions in the picturesque stream, because the Chinese have been the best managers of fish in the world. We in America are thousands of years behind the Chinese in intelligence in the preserving of fish. From times too ancient to be recorded in history, the Chinese have yearly taken loads of water in which there is spawn of fish, and have carried them to safe ponds where the newly hatched fry could be fed, usually with lentils or yolks of eggs. The result is that although China is over-populated, having at least three hundred persons to the square mile, while there are

only about twenty to each square mile in America, yet the rivers of China are full of fish of all kinds, while we, with our scant population, have almost exhausted the supply of fish in our rivers and lakes.

And this ancestor of our goldfish in its native stream is not gold at all, but is olive green above and yellow below. For a gold colored fish could not have lived long in a stream or lake; it would have been seen and swallowed by some wild duck, goose or swan, which birds occur in great numbers on Chinese streams; or a pelican would have gobbled it up into its great fish-basket. But its safe green color saved it, and its descendants were taken by the skillful Chinese and through much breeding and careful selection were changed in color to gold and silver. And if by chance we raise goldfish in our aquaria we find when they are small they have dull colors like their ancient ancestors; and if our goldfish in the ponds escape into the streams, by some helpful magic they soon regain their safe dull brownish-green color. Numbers of these fish are found in our rivers and the only way we know that they are goldfish is by their form, for we should never suspect it from their color.

While the Chinese originated the goldfish and developed it into many grotesque forms, it has remained for the Japanese to develop it into fish of the most graceful form and the most delicate colors. There are ten well-marked varieties of Japanese goldfish, each with graceful flowing fins and colors that range from black and gold and silver to pale blue and green. Americans are always surprised to discover how large a part goldfish play in the lives of the Japanese people, especially of the children. It is estimated that in Japan twenty million gold-

fish are sold each year at a value of half a million dollars. Even the humblest homes have their goldfish in little aquaria, while the wealthy have these brilliant little water pets in the ponds and fountains of their wonderful gardens.

Goldfish belong to the carp family, and are called by some the green carp. They may attain a length of eighteen inches. It is said that they may live to be a hundred years old, but probably this is an exaggeration. But there are instances on record where specimens have been kept in an aquarium and in good condition from ten to sixteen years.

The first goldfish seen in France were those imported for the famous Madame Pompadour. They were early established in Portugal, the streams near Lisbon swarmed with them, and from this source all Europe became stocked; and today in Portugal they are considered a delicacy for the table. From Europe they were brought to America and have become thoroughly acclimated. The annual sale of goldfish in this country is estimated at two millions.

Goldfish need and enjoy a warm temperature in still waters. Ponds are best for them, but they thrive in streams and multiply rapidly. They sleep in the broad sunlight at noon, and they also sleep at midnight.

Goldfish have good memories, and soon learn to recognize their master. It is therefore very important that only one person give them food and care, and these should be given with great regularity. In China, goldfish have been known to become so devoted to their master, that they would follow his boat, and seem to invite caresses from his hand. The famous goldfish breeder, Mr. Hugo Mulertt,

states that he had a Comet goldfish that formed a friendship with a little spaniel, and the two would play together through the glass of the tank, or even on the surface of the water for a time each day, as long as the fish lived.

If a little bell is struck every time the goldfish are fed, they will soon learn that it is the dinner call. Mr. Mulertt trained some of his goldfish to call for food by ringing a little bell arranged with a lever and string attached extending down into the water. At first, food was attached to the string, until the fish learned that when they rang the bell more food would come. Later they rang the bell so often that the string was only lowered into the water at meal time.

HOUSE

The best kind of an aquarium for goldfish is the balanced aquarium described on page 224. But the custom of keeping goldfish in globes is so firmly established that we must make the best of it, and lay down some rules for the use of these "Black holes of Calcutta" as someone calls them. The reason a globe is not fit for an aquarium is that its curved sides allow but a small portion of the surface of the water to come in contact with the air, if it is filled to the brim. Therefore if the globe is used, it should not be filled more than half or three-quarters full, so as to leave as large an area of surface of water as possible in contact with the air; the water should be changed twice a week, and the globes thoroughly cleaned, or the fish may suffocate. When the fish come often to the surface of the water, it is a sign that they are suffering for the want of air, and the water should be immediately changed, or dipped

out and poured back from the height of a foot or two, so as to become aerated. It is a good plan to have two globes, and so transfer the fish with the hands, or with a shallow dip-net from the one in which the water is stale, to the one containing fresh water; but the water in the two globes should be of nearly the same temperature. The globes should never be placed where they will receive sufficient direct sunlight to heat the temperature of the water appreciably.

If a balanced aquarium is used, there will need to be some tadpoles introduced to keep down the growth of low vegetation. Frog tadpoles are especially excellent for this purpose, since they remain in the tadpole stage for so long a period. There should be one tadpole for every two or three fish in the aquarium.

A north window gives the best light for the aquarium; it should stand at least six inches from the window, and a window shade should be used to regulate the light. Next to a north window an east window is best. In winter the aquarium should have all of the sunlight possible in our northern climate.

Placing the aquarium in too much light causes a prolific growth of fine green slime, which is a low form of vegetation. This should be cleaned, at least once a week, from the sides of the aquarium by the use of a small sponge, or a cloth, fastened to the end of a stick. A large glass pipette or dip-tube should be used to remove any foul material settling on the bottom. Once or twice a year the balanced aquarium should be thoroughly cleaned. The rocks, pebbles, sand and shells should be well washed and scalded with salt water. The sides

of the aquarium should be cleaned with salt. The best plants may be replanted.

In removing the fish to clean the aquarium, use a shallow dip-net, and place them in water of the temperature of that from which they are taken. Fish should be handled as little as possible.

FOOD

People are likely to overfeed goldfish. The dietary should consist of ant's eggs, given a few at a time, alternated with any of the standard fish foods, like Mulertt's I X L, or Spratt's Aquarium and Fibrin Fish Foods. Mr. L. S. Crandall, of the New York Zoological Gardens, advises the feeding of Spratt's Crissel in small quantities. Professor George Embody, who has charge of the Cornell University Fish Hatcheries, uses ground fish bought of Darling & Co., Union Stock Yards, of Chicago; he scatters a little of this in finely pulverized condition in the goldfish tank occasionally. But goldfish are essentially vegetable feeders, and ant eggs, crissel or ground fish should not be fed exclusively. Vermicelli, oat meal or rice wafer should be given also.

Many authorities object to feeding the rice wafer because it makes the water milky. This is not so objectionable in a globe as in a balanced aquarium, since the water in a globe may be changed often. Bread, or anything with yeast in it, should not be given to goldfish.

Drop a few flies on the water occasionally to afford the fish entertainment as well as change of diet.

Feed once a day in the morning at a regular hour, watch carefully, and feed only what the fish eat at

once, since waste food contaminates the water. The excreta of the fish should be dark-colored, and brownish or greenish; if it is whitish, or yellowish, the fish are being over-fed, and no food should be given for two days.

CARE

The following creatures should not be kept in the aquarium with the goldfish: Common pond snails, water boatmen, the young of water beetles and dragon flies, crayfish, salamanders, newts and turtles.

The following fish may be kept in the goldfish aquarium: Shiners, dace and suckers. Of course these fish should not be too large.

Suffocation is the most common ailment of goldfish. The symptoms are fading of the colors and loss of appetite. The remedy is to place the fish in freshly aerated water, to which add a teaspoonful of salt. Keep in a warm situation, and give no food for a few days. Give small quantities of food when feeding is commenced again.

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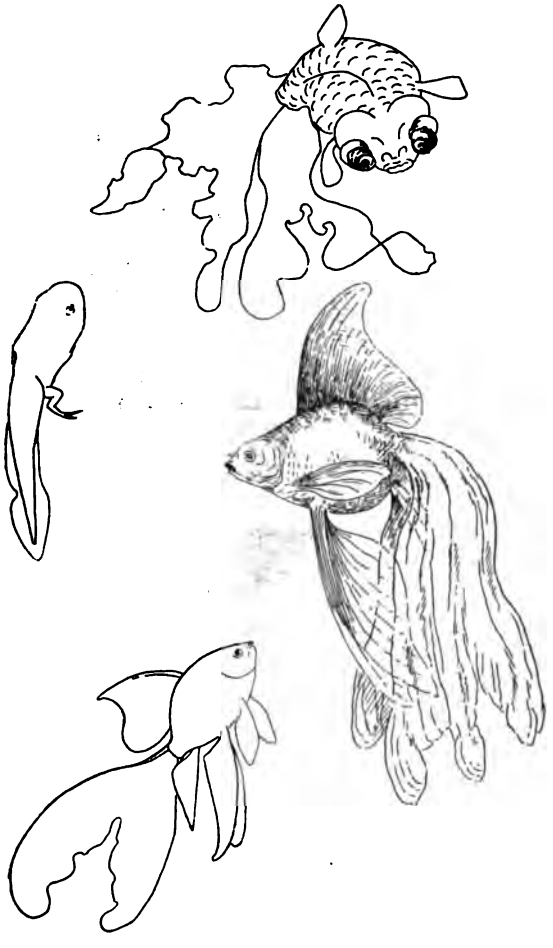
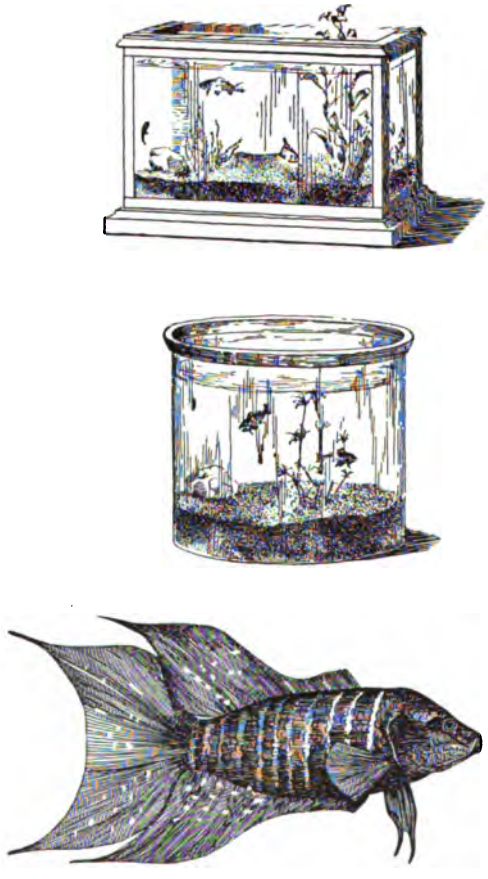


Drawing by Margaret Kephart

GOLDFISH



Drawing by Margaret Kephart

AQUARIA AND A PARADISE FISH

THE PARADISE FISH

PARADISE fish also come from China: its colors are as exquisite as those of the butterfly. The sides of the body are ornamented with cross-bars of alternating bluish green and brilliant orange; it is gray above, spotted with darker; the fins are orange, bordered with blue, and the ventral fins are mere bright orange threads. The male can always be distinguished by the spot on his cheek of dark blue bordered with orange. The dorsal, anal and tail fins are prolonged until they are as graceful as wings. The fins of the female are not so long as those of the male, nor does she have the cheek spot.

The Paradise fish has habits of breathing most convenient for life in an aquarium. It has a peculiar convoluted organ beneath its gill covers, which enables it to utilize the oxygen from the atmosphere. Thus these fishes will live in aquaria where no other fish could live since, when the water becomes stale, they come to the surface for air.

The Paradise fish are also convenient in their breeding habits for they will build their nests, lay their eggs and hatch their young before our admiring eyes. The mating season is naturally during June and July. However, when the aquarium is kept in a warm sunny place, they breed at other times of year. At this period the color of the male becomes peculiarly brilliant; he begins his courting by spreading his fins and swimming around and around his mate, to show her his graceful form and glowing tints; he often comes close to her, and seems

almost to kiss her, for he often touches her with his mouth. Once he is sure he has awakened an interest in her, he begins to build a nest of air-bubbles. He makes these exactly as does a blubbering child, but the saliva with which he clothes the bubbles as they leave his lips is strong, and holds the bubbles firm and fastens them together.

He likes to nestle his bubble raft down among the pond weeds of the aquarium, but it naturally floats and often appears on the surface of the water. In this nest the female lays her eggs; often she seems careless and allows some of the eggs to fall to the bottom of the aquarium, at which her watchful mate promptly gathers them up in his mouth and replaces them in the nest.

As soon as the eggs are laid the female should be removed to another aquarium since this frivolous mother is likely to eat her own eggs and young. The father is the responsible parent.

FOOD

Paradise fish should be fed once a day on animal food, for they naturally live upon the small creatures in the water. They take ants' eggs, mosquito larvae, water fleas, ground fish and crissel. Scraps of raw beef may be given occasionally, or an earth worm cut in small sections. Do not overfeed.

CARE

The water in the aquarium should never fall below 50° F. and may reach the temperature of 90° without doing damage to the fish.

These fish are so delicate they should never be lifted in the hands, or with a dip net. If necessary to catch one, place a dipper beneath it and lift it out water and all.

CHUB, SHINER AND DACE

OW much fun it is to fish for these little fishes of the brook and pond. They are near relatives, and have much the same habits, and all of them make attractive aquarium pets.

As an example of these, the shiner is typical. It is a fish which is ideal in form for slipping through the water. Seen from above, it is a narrow wedge rounded in front, and tapering to a point behind. From the side it is long, oval, lance-shaped. The scales are large and beautiful, and shimmer with exquisite colors along the sides. The minnows are darker than the shiners. The horned-dace develop little tubercules on the head during the breeding season, which are lost later. These fish live in our brooks and small streams, although they are found in large bodies of water. They lead a precarious existence, for the large fish eat them in all their stages. They only hold their own by laying great numbers of eggs. They get even with their big fish enemies by eating their eggs, but their usual food is water insects. They are pretty and graceful little creatures, and often may be seen swimming up the current in the middle of the brook. They often occur in schools or flocks, especially when young.

CARE

These fish do not need running water, but will live comfortably in a balanced aquarium if the temperature of the water can be kept cool. They are

very fond of earth worms, and other small water creatures. Meal worms also may be given; and ground fish food and crissel will be eaten in small quantities; only the larger scraps of these foods should be given.

MINNOWS

How silent comes the water round that bend;
Not the minutest whisper does it send
To the o'er hanging sallows; blades of grass
Slowly across the chequer 'd shadows pass,
Why, you might read two sonnets, ere they reach
To where the hurrying freshnesses aye preach
A natural sermon o'er their pebbly beds;
Where swarms of minnows show their little heads,
Staying their wavy bodies 'gainst the streams,
To taste the luxury of sunny beams
Tempered with coolness. How they ever wrestle
With their own sweet delight, and ever nestle
Their silver bellies on the pebbly sand!
If you but scantily hold out the hand,
That very instant not one will remain;
But turn your eye, and there they are again.
The ripples seem right glad to reach those cresses,
And cool themselves among the em'rald tresses;
The while they cool themselves, they freshness give,
And moisture, that the bowery green may live.

—*John Keats.*

THE STICKLEBACK

THE sticklebacks are small fish, but they have the ferocity of sharks. The stickleback is well named, for along the ridge of his back are sharp, strong spines, five of them in our tiny brook species. These spines may be laid flat, or erected stiffly, and used to saw the scales off of his enemies. When we find the minnows in the aquarium losing their scales, we may be sure they are being raked off by this sawback.

I have often kept in the aquarium several five-spined sticklebacks. This species is scarcely more than 1½ inches in length when fully grown. It is a slender, graceful fish, pointed like an arrow in front, and with the body behind the dorsal fin forming a long stem to support the rounded tail-fin. Its eyes are large and gem-like, and it has a wicked little mouth that opens upward.

If in April we take the dip-net and go to some stagnant pond full of pond weed, we may be able to capture a stickleback guarding his nest; and by lifting carefully, and placing the contents of the net in water at once, we may be able to study this marvelous structure. It is built by the father stickleback, and we find the algae called frog-spittle is the building material. With this plant he builds a hollow sphere, about the size of a glass marble; he cements the walls with a water-proof glue, which he furnishes from his body. At one side

of the pretty structure is a circular door. When finished, the nest is like a little green bubble.

When the nest is made, the stickleback goes wooing, and conducts his gay wife to his home. She enters the nest and lays her eggs within it, and then flits off with no further interest in home or young. However, if he feels equal to a family of large size, he goes wooing again, until his little green home contains as many eggs as he thinks he can care for. He then stands guard by the door, and by constantly fanning with his pectoral fins, sets up a current which flows over the eggs so that they do not smother. He drives off all intruders by the most ferocious attacks, and he will be taken in the net rather than desert his post.

CARE

Since the stickleback lives in stagnant water, the aquarium well stocked with pond weed gives it fitting habitation, and it will find its food among the tiny creatures which naturally live among the pond weeds. However, it is well to feed the sticklebacks occasionally with earthworms cut into bits small enough so that they may be swallowed. Small meal worms also may be given. The glass pipette must be used to remove from the aquarium the remains of the food.

REFERENCE

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Photo by Eugene Barker

A STICKLEBACK GUARDING HIS NEST

THE JOHNNY DARTERS

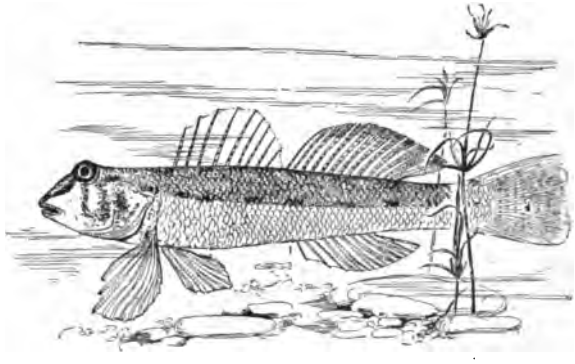
ARTERS they are by name and habit; and it is the boy who spends some of his time studying the bottoms of swift brooks who makes the acquaintance of johnny darters, for they like to rest, head up-stream, on the bottom of swift, clear brooks. They are well-called "darters," since their movements are so rapid when they are frightened that the eye can scarcely follow them. There is something comical in the appearance of a darter, with his alert eyes, placed almost on the top of his head; no wonder he is called "Johnny." A johnny will look at you with one eye, and then turn as quick as a flash and look you over with the other eye in a manner that shows how curious and interested he is.

The johnny darter has a queer shaped body; for his head and shoulders seem to be the largest part of him. The astonished and anxious look on his face is the result of the peculiar position of the eyes; the short snout and the wide mouth, give the johnny a face that is frog-like.

We are told that the pectoral fins of fish correspond to the front legs of animals; and the ventral fins to the hind legs. We can well believe this, if we watch the johnny darter in the aquarium, where he seems in a fair way to develop his fins into legs. The pectoral fins are large and strong, and are very close to the ventrals; when he rests upon the gravel, he supports himself upon one or both of these pairs of fins. Dr. Jordan says that the darters can climb up a water weed with their paired fins. I have even

seen one walk around the aquaruim on his fins as if they were little fan-shaped feet; and when swimming, the fins are used as a bird uses its wings.

There are many species of darters, some of them the most brilliantly colored of any of our fresh water fishes. In the breeding season the male is especially brilliantly colored.



CARE

Since the darters live in swift streams, they thrive best in an aquarium which has running water; however, if the aquarium is well-balanced, shallow and broad, and contains good oxygen-producing plants, the darter will live in it for a time. The aquarium should be kept cool for the darters cannot stand hot weather nor warm water.

Their natural food consists of the small creatures of the water, but they thrive when fed with small earthworms, and meal worms, and will learn to eat crissel and the fish foods.

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THE SUNFISH

THE boy who pulls a gamey, fighting pumpkin seed from the water should put him in the aquarium, instead of eating him, for he is a most interesting fish. First of all, he is beautiful; his body is cross-striped with dark, dull, greenish or purplish bands, worked out in fish-scale embroidery; and alternated with these bands are others of gleaming pale green, beset with black-edged orange spots, while the body below is brassy yellow. As he swims about, shimmering blue, green and purple tints play over him.

The sunfish has large and prominent eyes, the black pupil being surrounded by an iris of lavender and bronze. There is an ear-like flap extending back above the gill-opening, which is as great an ornament as a brooch, or an eardrop. It is greenish black in color, bordered by shining blue-green, with a prominent orange spot in its hind edge.

The sunfish is often called "Pumpkin-seed," or "Tobacco-box," but he really ought to be called "Indian Chief," for when his dorsal fin is raised, it looks like the headdress of a chieftan.

The male sunfish is especially beautiful in the spring; it is then he goes wooing, and needs his gay clothes in order to win his mate. First of all he builds him a charming little nest in shallow water near the shore, well hidden by pond plants. He digs out the pebbles and sand, making a saucer-like basin; sometimes the nest is lined with the natural sand, and sometimes with the rootlets of water plants. In diameter the nest is about twice the length of the fish.

Having thus prepared the home, he goes courting, and when trying to persuade his chosen one to come to his nest and there deposit her eggs, he faces her with his gill-covers puffed out, so as to show the scarlet spot on the "ear-flap." He may not be the only wooer, and he may have to take part in a sunfish duel before he wins. This is not a duel unto death, but is a spiteful attempt on the part of the rivals to mutilate each other's fins. The fellow with a torn fin seems to be ashamed of himself and retires from the field. After the eggs are laid, the father fish remains on guard and defends his nest with great valor until the young are hatched and swim away.

CARE

Since the sunfish is usually found in ponds or streams where there is dense vegetation, we at once take the hint as to the arrangement of its aquarium. It should be put into a balanced aquarium, with plenty of pond weeds of different kinds. Its natural food is small crustaceans, mosquito larvae, wrigglers or other small water creatures; if such can be procured, the sunfish will be very comfortable indeed. However, earthworms, meal worms, and raw lean meat, cut fine, may be substituted. All food that has not been eaten should be removed by a pipette to keep the water pure. The larger lumps of ground fish will be eaten. But with this and the cut meat—the bits will not be eaten after they have sunk to the bottom of the aquarium, and so should be removed soon.

I have kept one of these beautiful shimmering pumpkin-seeds for nearly a year in my aquarium, feeding him every alternate day with an earth-

Courtesy of Doubleday, Page & Co.

A SUNFISH

worm. I kept a store of earthworms in soil in a gallon jar in a cool place all winter. I found it necessary to keep each sunfish by himself, as they are fierce of disposition, and attack almost any small fishes in the aquarium.

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TO THE SUNFISH

"Little flat pumpkin seed, why do you hover
The roots of this willow so near?
And why did you chase that big bass to cover,
As if you knew nothing of fear?

"Little boy with a fish line, did you see me making
The nice little nest at the foot of this tree?
I have spent a long time quite busily raking
Back pebbles and rootlets,—like a saucer you see.
And in it are eggs, to dear fishlings awaking,
And none to take care or protect them but me."

THE CATFISH OR BULLHEAD

WHEN we study fish, we should try to understand how they are adapted by form and color for the peculiar place where they live. Any of the catfish are good examples of adaptation of form to life. The most common of the catfish is, probably, the bullhead, and it illustrates this principle well. It is mud-colored, and has no scales; since it lives in the mud it does not need scales to protect it. The skin is very thick and leathery, and not easily broken. The general shape of the front of the body is flat, and the bullhead is thus fitted for groping about the muddy bottoms of streams. The pectoral fins open out on the same plane as the body, and are weapons of defense, since the sharp tips of their spines punish whatever touches them.

Bullheads' eyes are oval, and rimmed with a narrow band of pale yellow; they are prominent, so that when moved backward and forward they command a view of the enemy in the rear or at the front, while the fish remains motionless; but after all, eyes are not much good to a fish that gropes in the mud for food, and the bullhead has developed barbels or feelers about the mouth, which assist in searching for food. Two of these barbels stand upright and give news of anything above; the large ones, one on either side of the mouth, are the most useful of all, and are kept constantly moving for new sensations. The barbels below the mouth give information as to the nature of things below them. The bullhead

Courtesy of Doubleday, Page & Co.

A BULLHEAD

Photo by Verne Morton

FISHING FOR MINNOWS

burrows deep in the mud in the fall, and remains there all winter, and undoubtedly these barbels are used in testing his surroundings in thick mud.

The bullheads build nests beneath logs or other protecting objects in shallow water. The nest is made by removing stones and gravel from a circular area on sandy or gravelly ground. Both parents work at removing the pebbles. After the eggs are laid, the father watches over and guards the nest, and both parents take care of the fry by stirring the eggs about so that they will not be smothered in the mass. After the young hatch, they are still cared for by the parents until they are old enough to take care of themselves. Thoreau says "The catfish spawn in the spring, and old fishes lead the young in great schools near the shore, caring for them as a hen cares for her chickens."

CARE

The bullhead can be kept in almost any kind of an aquarium, and does not need to have the water changed as often as do most fish; though to make the bullhead feel at home there should be fine gravel in the bottom of the aquarium, and many water plants on which it seems to browse. It may be fed with earthworms, tadpoles, and meal worms. Bits of raw meat or ground fish food may be given occasionally.

In handling the catfishes, gloves should be worn, for the spines of the pectoral fins are capable of inflicting a stinging wound.

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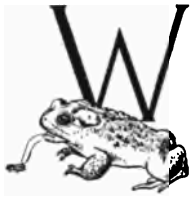
Amphibians

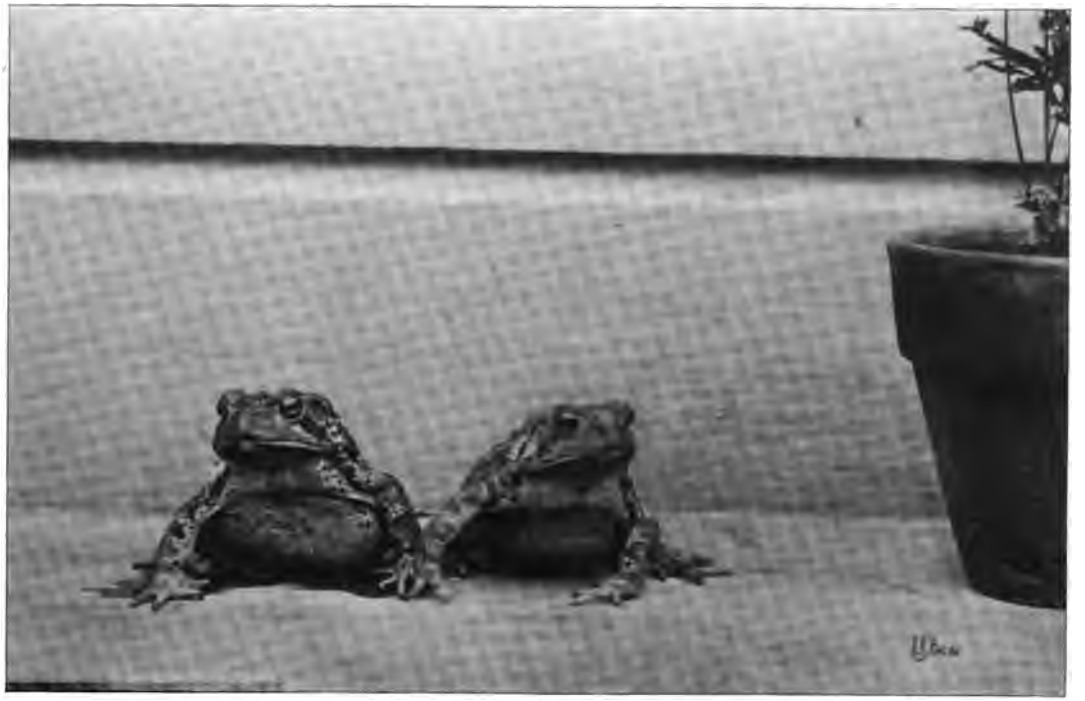
THE TOAD



WE have found that a pet toad in a little moss garden is far more entertaining than a goldfish in an aquarium. I shall never forget the actions of one of my toad pets after he had swallowed a Junebug; his face wore a surprised and pained expression, meanwhile he patted and rubbed his stomach with his little pudgy hands, as if to quiet its uneasy contents.

The toad's eyes have a beautiful golden iris. The ear is a flat, oval spot behind and below the eye. The mouth is wide, and the jaws are horny, with no teeth. The tongue is attached to the front of the lower jaw. It is covered with a sticky secretion, and may be darted out for a long distance; its aim is excellent, and any insect that it touches sticks fast and is brought back to the mouth and swallowed whole.

The warty back of the toad protects it from the sight of its enemies, for its color and roughness make it appear like the soil. The toad also has the power to change color more or less to match any soil it happens to be in. The toad's warts do not make warts on the hands that handle him; but many of them, especially the big ones just behind the head, are glands which secrete a poisonous, milky substance when the toad is seized; this is evidently



Courtesy of Doubleday, Page & Co.

SETTING FOR THEIR PICTURES

Photo by H. D. Bailey

TOADS DO NOT MAKE WARTS

meant to discourage its enemy from swallowing it, but snakes do not seem to be affected by it. The toad is not slimy, but is perfectly dry and pleasant to handle. It especially likes to have its back scratched gently.

The way to enjoy a pet toad is to have him established in your garden, and then watch him. He has an interesting way of working himself down into the soil backwards, thus making himself a hiding place during the day; but he will come out in the late afternoons and evenings, and catch any insects that may be feeding upon the garden plants. In the winter he burrows deep in the ground and goes to sleep. He is a great jumper, and a rapid, graceful swimmer. He is fond of music, especially if it is sweet and melodious. Perhaps this is because he is such a good singer himself; his crooning trill forms one of the most pleasing notes of the pond chorus in the spring.

The mother toad places her eggs at the bottom of pools and quiet streams; she lays them in long jelly-like strings during May and June. The development of the little tadpoles from the eggs is most interesting to observe. The tadpole is a creature fitted to live in the water. Its long, flat tail, surrounded by a fin forms an effective swimming organ. At first it breathes by gills, but in its later stages develops air-breathing lungs. When the tadpole is a month or so old, the hind legs begin to show. Two weeks later the arms may be seen, the left one pushing out through the breathing pore. Meanwhile, the tail is being absorbed and becomes shorter and shorter. At last, some warm, rainy day, we find the tadpole changed to a tiny toad, with a big head, thin body and stumpy tail; it swims ashore,

lifts itself on its bow-legs, and walks off, toeing in, with a very grown-up air.

HOUSE—THE MOSS GARDEN

This should be an aquarium jar, either square or circular, covered by wire netting, with a bottom of gravel sloping up to dry land on one side, and with about three inches of water above the shallower gravel. A flat stone may be used as a landing place, or moss may be planted to make the shore for our toad to bask upon. The water needs to be changed once a week; it may be either siphoned out, and two or three rinsings also siphoned out, or it may be emptied entirely and cleaned and refilled. Water to bathe in is necessary to the toad, since it does not drink through its mouth, but absorbs the water which its system needs through the skin, when lying spread out in the water. If a toad is kept without water in a dry room, it will dry up and die.

FOOD

All kinds of insects, from the hairy caterpillars to squash-bugs, are relished by the toad. It is especially fond of meal worms. It is a good plan during the summer to catch flies in a wire netting fly-trap, dip the trap, flies and all, in water for a moment, then empty into the toad's cage. It will also take bits of raw beef or liver from forceps, or the tip of a broom-straw which is wiggled before its eyes. A large meal once a week is sufficient for a toad in captivity.

A TADPOLE AQUARIUM

Professor S. H. Gage, an eminent authority, gives the following directions:

Take a tin or agate pan or a deep earthenware washbowl to some pond where tadpoles live.

Take some of the small stones from the bottom and at the sides of the pond, lifting them very gently so as not to disturb what is growing on their surface. Place these stones on the bottom of the pan, building up one side higher than the other, so that the water will be more shallow on one side than on the other; a stone or two should project above the water.

Take some of the mud and leaves from the bottom of the pond, being careful not to disturb them, and place upon the stones.

Take some of the plants found growing under water in the pond and plant them among the stones.

Carry the pan thus prepared back to the house and place it where the sun will not shine directly upon it.

Bring a pail of water from the pond and pour it very gently in at one side of the pan, so as not to disarrange the plants; fill the pan nearly to the brim.

After the mud has settled and the water is perfectly clear, place in it some of the tadpoles which should be hatched in a glass aquarium. Not more than a dozen should be put in a pan of this size, since the amount of food and microscopic plants which are on the stones in the mud, will afford food for only a few tadpoles.

Every week add a little more mud from the bottom of the pond or another stone covered with slime, which is probably some plant growth. More water from the pond should be added to replace that evaporated.

Care should be taken that the tadpole aquarium be kept where the sun will not shine directly upon it

for any length of time, because if the water becomes too warm the tadpoles will die.

Remove the "skin" from one side of a tulip leaf, so as to expose the pulp of the leaf, and give to the tadpoles every day or two. Bits of hard-boiled egg may be given now and then, or a little of the ground fish.

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HANDBOOK OF NATURE-STUDY, *A. B. Comstock.*

A TOAD STORY

In early spring, I was a little egg
  In a long jelly string with pond mud dim;
I hatched to a tadpole with never a leg,
  But with a long tail fin so I could swim,
And with nice little gills on the sides of my head
  Which after a while I thought best to hide;
Then I swallowed the water to breathe, instead,—
  It flowed out through a hole in my side.
I ate little things, too small to see,
  I ate a great many and I grew with vim,
My hind legs came with webbed toes free
  And they soon learned to kick and help me to swim.
My tail shortened up and my eyes bulged out
  And my two legs in front soon began to grow.
Before the children guessed what I was about,
  I was a nice little hop-toad you know.
And now I live here under a seat,
  In a garden where the fern fronds shade;
And here I find things jolly good to eat,
For my tongue is just like tangle-foot made;
  It is fastened to the front of my jaw;
When a beetle, a fly or a bug comes along
  I aim and I swoop them into my maw.
I sleep in a cave the cold winter long.
In spring I come out and sing a sweet song.

From Country Life in America

A TOAD SINGING

Courtesy of Doubleday, Page & Co.

A FROG SWIMMING

Photo by Verne Morton

NICE FROGGIE!

THE FROG

THE FROG is not so easily tamed as the toad, but it makes an attractive inhabitant of the aquarium. It is slimmer than the toad, and is not covered with warts. It is slippery to the touch, and, like the toad is cold, for both of them are cold-blooded creatures, which means their blood is the temperature of the surrounding atmosphere. The blood of a warm-blooded animal maintains a certain temperature whether the surrounding air is cold or hot.

The frog is quite as good a jumper as the toad, and is a far more powerful swimmer, since it lives most of the time in or very near the water. The frog shows its relation to the water by being the color of the brook bottom, or of the water-plants, green and yellow being its prevailing hues. The frogs, like the toads, have the power of changing color more or less to match their surroundings.

The common green frog, the leopard and pickerel frogs are those most commonly kept in the aquarium. These species like to stay in the water, but they find most of their food in the rushes, or other vegetation along the banks of streams or ponds. These frogs are all attractive singers.

The bullfrog is also a common aquarium pet, but he cannot be trusted in the same tank with any frogs or other creatures less huge than himself. He is the most aquatic of all our frogs, and can remain beneath water for a longer period than any. Nevertheless, he likes to come out on a flat stone and enjoy the air and

sunshine. He is an omnivorous eater of living creatures, and has small teeth on his upper jaw. He feeds upon minnows, crayfish and tadpoles, and anything else that he can entice into his capacious mouth.

Frog's eggs are laid in masses of gelatine-like substance, but they are never laid in strings, like the toad's. The frog tadpoles require a longer time to mature than do toad tadpoles, usually about four months. However, the great tadpoles of the bullfrog do not attain frogship until the second, and sometimes the third season.

HOUSING, FOOD AND CARE

An aquarium built as described for the toads does as well for frogs. Food should be given but once a week, but this meal should be a large one. Frogs like all kinds of insects, and meal worms may be given during the season when other insects are not available. The bullfrogs may be fed minnows, earthworms, and even mice. All frogs are fond of raw liver and this may be used constantly for food during the winter.

The water in the aquarium should be completely changed each week, the day after feeding.

Frog tadpoles may be kept in an aquarium similar to that described for the toad tadpoles. The young ones are especially fond of the tulip leaves prepared as described.

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Courtesy of Doubleday, Page & Co.

A FROG AT HOME

Photo by H. D. Bailey

FROGGIE'S HAND IS DIFFERENT FROM HIS FOOT

THE TREE-FROG

ANYONE may keep these charming creatures for a long time very comfortably in a moss garden. Dr. Samuel Henshaw, of the Cambridge Museum of Natural History, writes:

"I have had for some years two of the tamest, dearest tree-frogs (*Hyla versicolor*), you can imagine. They sit on my finger and take their meal worms, and they cuddle in the most attractive manner. Their voice is delightful, especially when unexpected and out of season."

My own favorite is Pickering's Hyla. I kept one of these for many months, and often in the night it would startle the entire household by giving a long, clear, melodious note, like that of some large bird.

The reason we see so little of tree-frogs is because they can change color to suit their surroundings. I have taken three of these peepers, all of them pale yellowish brown with grey markings, and have placed one upon a fern, one on dark soil, and one on the purple bud of a flower. Within a half hour each matched its surroundings so closely that a casual glance would not detect it.

The song of the spring peepers is loved by everyone who dwells in the country. How such small creatures can make such a loud song is a mystery. It is interesting to watch one of them singing; the thin membrane beneath the throat swells out until it looks like a little balloon with a froglet attached.

The tree-frogs have toes and fingers ending in little circular disks, which secrete, at will, a sticky substance, by means of which they can cling to vertical

surfaces, even to glass; they thus cling to tree trunks. The tree-frogs take in air and breathe by means of the rapid pulsation of the throat membrane. The nostrils are two tiny holes on either side of the tip of the snout. The ears are a little below and just behind the eyes, and are in the form of a circular slit. The tongue is like that of other frogs, hinged to the front of the lower jaw; it is sticky, and can be thrust far out to capture insects, of which the tree-frogs eat many.

The eggs of the spring peepers are laid in ponds during April; each egg is at the center of a little globe of jelly, which is fastened securely to stones or to water plants.

The tadpoles are small and delicate, and differ from those of other frogs in that they often leave the water while yet the tail is quite long. In the winter the tree-frogs sleep safely hidden in moss and leaves, but awaken to give us the earliest news of spring.

HOUSE

Take a small aquarium jar and place in it sphagnum moss, or other loose moss. This should be kept wet, but not allowed to mould. Bits of small branches covered with lichen may be placed in the cage for the froglets to climb upon. The moss should be thoroughly washed occasionally.

FOOD

All peepers like flies the best of anything. Catch these in a wire-meshed trap and partially drown them and then empty the contents of the trap into the peepers' cage. Peepers also like meal worms and other small worms and insects. They should be

From Country Life in America

A TREE FROG

given a good meal once a week. They will take bits of liver from forceps if it is wiggled in their faces and some learn to take it as soon as offered.

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THE SPRING PEEPERS

A thousand tints of living green
O'er hill and dale are flung;
Vague, verdant mists thread purple woods
With shadbush banners hung.
The still pools in the meadow-lands
Reflect the heaven's own hue,
Where lark songs, soft and lonely,
Float upwards to the blue.

There wells up from the sodden swamp
The peepers' chorus strong,
An orchestra of froglet throats,
Like bubbles filled with song,
Which brings sweet comfort to the hearts
That found the winter long;
For Hylas' music to the Spring
Forever must belong.

SALAMANDERS AND NEWTS

A SALAMANDER makes an unexpectedly interesting pet, for it seems to have a better memory than most of its near relatives. Mr. Deckert, of the New York Zoological Gardens showed me with pride a cage of salamanders, which as soon as he tapped the cover immediately lifted up their heads in a most expectant manner awaiting their food; and Dr. Samuel Henshaw writes: "Among my pets, some large spotted salamanders are my especial favorites, (*Amblystoma punctatum*) some of which I have had even longer than the *Hylas*. They recognize the approach to their home, and poke their heads out of the sphagnum and take four or five meal worms from the forceps as naturally as a dog takes its piece of meat."

Various salamanders may be kept in aquaria or moss gardens, but the most charming of them all is the little orange-colored creature that we find sprawling across woodland paths after summer showers. These do not rain down, but they are obliged to do their traveling when the ground is wet, otherwise they would dry up and die. Thus, these newts make a practice of never going out except when it rains. The gay little creature (*Diamyctylus viridescens*) has an orange body, ornamented with vermillion dots along each side, each dot surrounded with tiny black specks; black specks are also peppered along its sides. Its greatest beauty lies in its eyes, which are black, with elongated pupil, and surrounded with a golden shining iris. It has no eyelids, but the eyes can be pulled back into the head, completely out of sight.

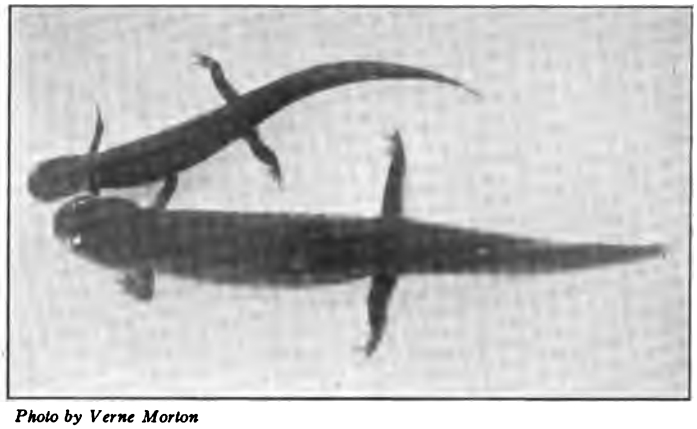

Photo by Verne Morton

NEWTS SWIMMING

A RED-SPOTTED NEWT STALKING PLANT LICE

The following is the history of this species as summarized from Mrs. S. H. Gage's charming "Story of Little Red Spot": The egg was laid in some fresh water pond on the still borders of some stream where there is a growth of water weed. The egg, which is about the size of a small pea, is fastened to a water plant. It is covered with a tough but translucent envelope, and has at the center a little yellowish globule. In a little less than a month the newt hatches, but it looks very different from the form with which we are most familiar. It has gray stripes upon its sides and three tiny bunches of red gills on each side, just back of its broad head. The tail is long and very thin, surrounded by a fin; it is an expert swimmer and breathes water as does a fish. After a time, it becomes greenish above and buff below, and by the middle of August it has developed legs and changed its form so that it is able to live upon land; it no longer has gills or fin; soon the coat changes to the bright orange hue which makes the little creature so conspicuous.

The newt usually keeps hidden among moss, or under leaves, or in decaying wood, or other damp and shady places; but after a rain, when the whole world is damp, it feels confidence enough to go out in the open, and hunt for food. For two and a half years it lives upon land and then returns to the water. When this impulse comes upon it, it may be far from any stream; but it seems to know instinctively where to go. Soon after it enters the water, it is again transformed in color, becoming olive-green above and buff below, although it still retains the red spots along the back as mementoes of its land life; and it also retains its pepper-like dots. Its tail develops a fin which extends along its back and is somewhat ruffled. In

some mysterious way it develops the power to again breathe the air which is mixed with water.

The male has the hind legs very large and flat; the female is lighter in color and has more delicate and smaller legs. It is here in the water that the newts find their mates and finish careers which must have surely been hazardous. During its long and varied life, the newt often sheds its skin like the snake; it has a strange habit of swallowing its cast-off coat.

Thus we see the newt is sometimes fitted for life in the aquarium, and sometimes for life in the moss-garden; I confess I like it better in the latter place. I kept one for a long time in a tiny moss-garden made in an aquarium jar. He would not eat earthworms, but he was very fond of plant-lice, and it was fun to see him stalk them. As soon as he would catch sight of a smug plant-louse on the leaf, he would show excitement, and hold his breath so the throat ceased pulsating; he would hold himself tense, and stretch the neck out long and thin, until his snout was within half an inch of the unsuspecting plant-louse, then his tongue would shoot out and swoop in the aphid. Sometimes when he first saw a plant-louse he would sneeze and snort, like a dog eager for game.

HOUSE

Adult salamanders should be kept in a balanced aquarium with plenty of pond-weeds; they will spawn readily; the eggs will be placed on water plants near the surface of the water; they hatch in about two weeks.

For the newts that are found on land, the moss-garden, or a fernery, is the place to keep them. Dampness is essential to their existence.

FOOD

Feed the full-grown newts in the water, worms, flies, little tadpoles, small fishes, and snails. Shreds of raw meat or liver may also be fed. The newts are voracious, and will destroy each other, so all specimens in he same aquarium should be about the same size.

Feed the newt tadpoles as soon as hatched, finely scraped beef, or small insects.

For the newts in the moss-garden small insects must be provided, althouh they may be taught to take scraped meat, bits ofliver, minced earthworms, or meal worms from the point of a wire, or in forceps, if wiggled seductively before their eyes. All newts become tame, and they will soon learn to follow the one who feeds them, as far as their surroundings will permit.

REFERENCE

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TO LITTLE RED-SPOT

You funny, little, orange elf,
  Sprawling across my way,
What are you doing with yourself
  This misty, rainy day?

He looked at me with golden eyes,
  And as he onward sped,
"I am going where my home pond lies,
  It's a long way off," he said.

"Within its green depths, cool and chaste,
  My sweetheart waits this noon,
So please, kind sir, excuse my haste,
  For I must get there soon."

Reptiles

TURTLES

A SMALL turtle in a properly fitted aquarium jar, placed on one's desk is a source of much entertainment. Daniel is the name of the baby painted terrapin which has thus entertained me for months. Daniel is a beauty, from his pink margined, two-inch shell to his black, yellow-striped head, and yellow-irised eyes; in fact, his eyes are particularly brilliant, and with their aid he makes observations on my habits for hours at a time. I place him on the bit of wood which imitates a log at one side of his pond, meanwhile he has drawn back his head, feet and tail, within the protective shell. But very soon he protrudes his head and looks me over; concluding that I am harmless, he puts out gingerly two pairs of bow-legs, the hind pair ending with four, and the front with five sprawly claws; and when he becomes entirely free from fear, he unfolds in the rear a little triangular striped tail.

Daniel's accomplishments are many; he can sprint surprisingly fast when I take him out to clean his quarters; and if I place him on his back on the table, he stretches out his head, and using his snout as a pivot, he will soon claw himself right side up. He can climb out of the water upon his little piece of log with dexterity, and he can also scramble off the log in a great hurry; when in the water he can swim

Photo by Verne Morton

THE BABY TURTLE

From Country Life in America

A MOTHER TURTLE DIGGING A NEST FOR HER EGGS

From Country Life in America

TURTLE EGGS AND YOUNG JUST HATCHED

forwards or backwards, or balance himself with the tip of his snout above the surface of the water. He can also yawn in the sleepiest fashion, opening wide his mouth and shutting his eyes. He has eyelids like mufflers, and when he closes his eyes he pulls them back into his head, and the mufflers close over them. He loves to sprawl in the sunshine, and take a sun bath with his legs, tail and head as far out of the shell as possible. When he is disturbed he hisses. The glass of his aquarium is too much for Daniel's comprehension, and he spends a deal of time trying to decide why he cannot swim through it.

However, Daniel's greatest accomplishment is his interest in music. There was a dreamy look in his eyes as he lay sprawled out in the sun one day that gave me the idea. I straightway bought a harmonicum and each day before I fed him I played a few strains. He was attentive to the music from the first; but after the fourth day he associated it with the joys of a dinner of liver minced finely with scissors, for that is what he likes best. Ever since then as soon as he hears the music he evinces the keenest interest, often lifting himself up on his hind legs against the side of the aquarium and stretching up his head until he looks like a little snake in a box. He also recognizes me as the source of his food supply, and tells me that he is hungry by trying to swim toward me through the side of the aquarium with great persistence. If I move to the other side of the room, he moves to the corresponding side of his aquarium. He finally lost all fear of me and when I lift him from his aquarium he does not take the trouble to retire into his shell, not even pulling in his tail, which is a supreme test of his confidence.

The turtle is an animal with an ancestry that dates back to the time when strange monsters wandered over our earth,—times when a turtle without a shell would have soon been made into a dinner. The turtle's shell has been such a protection that it has not needed to move swiftly, it therefore is a slow walker. The upper part of the shell is called the carapace, and the lower part the plastron. The carapace is grown fast to the turtle's back-bone; it is made up of plates, and as the turtle grows, each plate increases in size around its edges; this shows very well in the shell of the wood turtle, each ridge around a plate representing a year's growth.

Turtles are air-breathing creatures, and do not have gills like fish; they are obliged to come to the surface for air supply, but they can remain below water without breathing for hours at a time. The throbbing of the throat is a process of forcing air into the lungs.

Turtles do not have teeth, but are provided with sharp-edged, horny beaks. All turtles hatch from eggs which are laid in the ground near the shores of ponds and streams. The eggs are white, and are round or oval; in some cases the eggshells are parchment-like, in others they are hard like the shells of birds' eggs.

The different species of common turtles have such different habits, that each has to be treated and fed in its own especial manner.

THE SNAPPING TURTLE

This is rather a vicious pet, for it extends its neck to a length nearly equal to that of its shell, and strikes like a snake. The only way to lift a big snapper

safely is by the tail, but a small one may be lifted by the rear portion of the shell. The snapper has a great appetite, but it should not be fed from the fingers, since it might inflict a wound incidentally. It cannot swallow its food unless it is under water, therefore there must be a sufficient depth of water in its aquarium to cover it. It may be fed upon small pieces of fish, and chopped raw meat or liver.

THE MUSK AND MUD TURTLE

These inhabit slow streams and ponds, and are truly aquatic, since they only come to shore to deposit their eggs. The musk turtle, when handled, emits a very strong odor. These turtles may be kept in a deep aquarium, and do not need an object upon which they may climb upon out of the water. They love to bask in the sunshine in shallow water. They may be fed with fish and earthworms, or other small-bodied creatures. There should be a place in the aquarium where they can hide when they are feeding.

THE PAINTED TERRAPIN OR POND TURTLE

This can be easily identified by the scarlet and black ornamentations of the margins of the upper shell. It makes a good pet if kept in an aquarium by itself, but will destroy other creatures. It also likes to eat the legs and the tails of its fellow terrapins. It must have some object in the aquarium upon which it can climb above the surface of the water. It will browse upon fresh lettuce, will eat of raw, chopped fish, but is especially fond of raw chopped beef or liver. It always feeds under water.

THE SPOTTED TURTLE

This has a black upper shell, ornamented with numerous round yellow spots. It is common in ponds and small streams, and likes to climb out upon logs. It always feeds under water, and is not able to swallow otherwise. Its natural food is dead fish and aquatic insects. In captivity it will eat lettuce leaves and chopped raw fish.

THE WOOD TERRAPIN

This is a very common turtle, and it lives mostly on land in damp places, although it swims rapidly. The plates of its upper shell are ornamented with concentric ridges. All of the fleshy parts of the creature, except the top of the head and the legs, are brick red. It feeds upon tender vegetation, berries and insects. It will also eat chopped fish and meal worms. One that we had was particularly fond of cherries, and soon learned to know the one person who fed it, and seemed to like to be fed from the hand. It should be kept in a garden. It needs to have access to water.

THE BOX TURTLE

This well-protected turtle lives entirely upon land, and especially likes open grassy spots in open thickets. Its natural food consists of berries, the larvæ of insects, worms and snails. It is especially fond of blackberries. The box turtle should be kept in a garden, where it will spend its time hunting worms, snails and slugs. It may be fed berries, bananas or mushrooms, and it must have access to water, although it does not need to live in an aquarium.

Photos by Harry H. Knight and Verne Morton

DANIEL, A PAINTED PET TERRAPIN
PUTTING DANIEL BACK IN HIS HOME STREAM

From Country Life in America

FEEDING A PET LAND TORTOISE IN CALIFORNIA

THE SOFT-SHELLED TURTLES

These look much like animated pancakes, and are often kept in aquaria. They never leave the water except to lay their eggs. They should be provided with a deep tank, and some object upon which they can crawl out of the water occasionally; this should be of smooth wood. The bottom of the tank should be covered with three or four inches of fine sand. They may be fed with chopped fish, or minnows, chopped raw beef or earthworms.

THE TORTOISE

The tortoises may be distinguished from the turtles or terrapins by their webless feet and large clubby nails. They live entirely upon the land, being fond of sandy barrens; they make burrows in the ground into which they retire. The gopher tortoise, well known in our Southern States, is the best known of the American tortoises. It thrives in captivity, but must be kept in an atmosphere of from 70° to 80° F., and in absolutely dry quarters. It will soon learn to eat from the hand of the master, and should be fed upon tender vegetables, like celery, lettuce, and all kinds of fruit. It will also eat raw meat. The European tortoises are ordinarily kept in gardens.

HOUSE

For the water and pond turtles an aquarium, containing a few inches of water, and a piece of log projecting above the surface is necessary. Such an aquarium should be placed in a sunny window, for the turtles need the sun to keep them healthy and happy. Specimens of different sizes should not be kept in the same aquarium, for the large ones will

mutilate the smaller ones. The wood turtle and box turtle may be kept in wired enclosures in the garden, but they should have access to sunken basins of water. The land tortoise must have an absolutely dry situation.

FOOD

Turtles do not need to be fed but once a week when in captivity. The day after feeding, the water in the aquarium should be changed. All except the land tortoise are fond of raw fish and liver, which must be chopped. Care should be taken to prevent a turtle from walking off a table, for if the shell is cracked the creature is likely to die. Since the turtles everywhere, except in the extreme South, hibernate in winter, they naturally become sluggish at this season, and do not eat as freely as they do in the summer.

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DENIZENS OF THE DEEP, *Frank P. Bullen.*
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"Turtle Eggs for Agassiz," THE FACE OF THE FIELDS, *D. L. Sharp.*

TO DANIEL

A pet painted terrapin who was fond of music.

You are a charming terrapin, with pink and scalloped shell,
You have your gold-rimmed eyes and accomplishments as well.
You are charming when you swim and when in sunshine warm you sit
With legs and head and pointed tail all stretched out, every bit.
Amusing too you always are when on your back you lie
And right yourself on pivot nose,—it is fun to see you try.
But tell me, Daniel, honestly, when to music strains you come,
Do they appeal unto your soul or to your little "tum?"

Photo by H. D. Bailey

WILLIAM AND HIS PETS

Courtesy of Doubleday, Page & Co.

A SNAKE IN THE HAND IS WORTH TWO SPOTTED ADDERS ON THE GROUND

PET SNAKES

HERE is many a boy, who would scorn caring for a canary, finds a pet snake absorbingly interesting. A snake is not only a beautiful creature, but is wonderfully constructed. The length of its back-bone is truly astonishing, some snakes having three hundred vertebræ. We can tell how many our pet snake has by counting the crosswise scales on its lower side, as there is a pair to each scale. These scales take hold upon the surface of the ground and thus help the snake to glide. We can feel the action of these scales if we let the snake move over our hands; they are worked by the action of the ribs, for each vertebra, except the one directly behind the head, is equipped with a pair of ribs. The snake has unwinking eyes because it has no eyelids; but the eye is covered with a transparent skin, like a watch-glass. When a snake sheds its skin, it begins the process at the lips, and the whole outer skin is turned inside out from head to tail. If we examine one of these shed skins we can see the covering of the eyes. Snakes can hear very well although they have no outside ear. They also have a keen sense of smell, some snakes hunting their prey by scent, like a dog. The tongue, which can be darted out so far, is an organ of touch; and this act on the part of a frightened snake is not one of defiance, but an attempt to discover the nature of its surroundings.

Snakes are the only creatures which are able to swallow objects larger than themselves. This is made possible because the body walls are elastic, and because there is an extra bone hinging the upper to the lower jaw allowing the jaws to spread widely; the lower jaw also parts at the middle of its front edge, and spreads sidewise. In order to force a creature into a bag so manifestly too small, a special mechanism is needed; the teeth supply this by pointing backward and thus assist in the swallowing. Some species of snakes simply chase their prey, striking it and catching it in the open mouth; while others, like the black snake and the milk snake, wind themselves about their victims and crush them to death. In our northern climate snakes hibernate in winter, going to sleep as soon as the weather becomes cold, and not awaking until spring. Some species of snakes lay eggs with shells like parchment, while with others the young are born alive. Most snakes give off a secretion when attacked and frightened, which smells very disagreeable, and the odor persists on the hands of the captor despite much washing.

The garter snakes are among the most common and harmless of all our snakes. We once had a handsome black, yellow-striped garter snake that lived under our piazza for several years. He was unafraid of the family, and loved to bask in the sun on the doorstep, to the horror of callers who were not educated to appreciate the beauty of snakes. However, the children of the neighborhood made him frequent visits, and were particularly interested when he lifted his beautiful head and darted out his tongue, for they knew that this was his way of trying to get acquainted.

From Country Life in America

A PAIR OF GARTERS

From Country Life in America

PINE SNAKE

Photo by H. D. Bailey

THIS LITTLE CHILD LOVES LIVING PLAYTHINGS

The garter snakes usually congregate in numbers in the fall in rock ledges and stony hillsides, where each snake finds a safe crevice or makes a burrow, which may be extended a yard or more under ground. After spring opens they scatter to banks of streams and to edges of woods where they can find an abundance of earthworms, insects, toads, salamanders and frogs, which make up their natural diet. The young are born late in July, and are nearly six inches long at first; one mother may have a brood of from eleven to fifty snakelings; she remains with them during the fall to protect them, although the little snakes find their own food directly after birth.

In addition to the garter snake, Mr. Karl Schmidt recommends the pine snake and the blowing snake for pets. Mr. Richard Deckert, of the New York Zoological Gardens, recommends the king, the gopher, the pine and the bull snakes for pets. He also says that the milk snake is not a very hardy pet. It can, however, be kept in a cage for one or two months without food, provided it is supplied with fresh drinking water. It will endure this fast and then may be turned loose; although a beautifully marked snake, Mr. Deckert finds it rather surly and high tempered, and it should never be put in with the garter snakes since it is a constrictor, and a small milk snake will kill a garter much larger than itself.

Mr. Deckert says that water snakes may also be kept in a vivarium; and that although they usually offer to bite when first caught, and also emit a stench, yet after a few days they are among the hardiest snakes in captivity.

HOUSE

I am indebted also to Mr. Deckert for the following suggestions for a snake cage and for feeding these pets: The cage or vivarium should be eighteen inches long, eight inches wide and twelve inches high. If a larger cage is desired these proportions should be kept. The cage should have the bottom and three sides of wood, and one side of glass. The bottom should be covered with large pebbles, sphagnum moss or slabs of bark. If pebbles are used, a slab of bark should be laid on top of them, so that the snake will find a retreat behind it. A small branch should be firmly fixed in the cage to provide a basking place. The cover of the box should be of wire screening, and when in place it should be securely hooked to prevent the snakes from prying it open. A cage of these dimensions will do for four or five garters.

FOOD

Give the garters minnows, small frogs and toads and large earthworms. They will subsist almost entirely upon the earthworms. The frogs and toads may be killed first and presented to the snake on the end of a stick in a lively manner.

The milk snake must be fed a mouse or very young rat, if possible, every week or ten days. Water snakes should be fed fish, frogs and toads; they refuse to take earthworms. Fresh, clean drinking water is an absolute necessity for a snake's well being. It should be placed in a small enameled pan, like a soap-dish, from four to six inches long, about three inches wide, and one and one-half to two inches deep. Fresh water must be given every day, although reptiles need not be fed but once a week. Do not be

worried if pet snakes refuse food for two or three weeks; they often do this without harm.

CARE

When changing the water in the snake cage look for the excreta and remove it with a dull knife, like a putty knife, or wipe from the wood of the cage with a damp cloth. The cage may be placed in a window, but there should be some shade in the cage at all times. During the hot summer months it is best to keep the vivarium in a shady, cool place. However, all snakes love to bask in the sunshine, so it is well to have the cage where the sunlight may strike it during a portion of the day.

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TO A GARTER SNAKE

Living under the piazza

Graceful little tenant
Of a cell beneath my floor,
I admire your long black garment
Broidered with yellow o'er.
I like you when with forked tongue
You lift up to explore,
To find if we are friendly,
And willing to ignore
The presence of a stranger
Curling around our door.

THE ALLIGATOR

IT is needless to say that the alligator is safe for a pet only when it is quite young. In fact, when it is less than a year old, for then it attains a length of eighteen inches. When two years old it is two feet in length, and too large for a pet. The baby alligator, brought North for a pet, is too often doomed to an early death, for it needs the heat of the tropics to make it comfortable.

The pet alligator started life as an egg, not much larger than a hen's egg, but somewhat longer. This egg, with from forty to sixty others, was laid in a nest by the mother alligator in the sand of the shore of some stream. The nest with its many eggs she covered with dead leaves and twigs, so that it made a mound two feet high, and about eight feet in diameter. Under these bed clothes, and with the heat of the southern sun, the eggs hatched into tiny alligators from six to eight inches long. The mother kept watch of her nest, and when the young hatched, she led them to shallow waters, where there were plenty of small fish, and fewer of great creatures that fed upon small alligators.

The alligator reaches maturity in four or five years in its own hot lagoons of Florida. Some attain a length of twelve to fifteen feet, but such specimens are rarely found now, because the slaughter of these creatures has been merciless. The alligator's way of fighting is to use its tail to knock down its prey, and sweep it into its open jaws. The tail is about one-half the length of the entire creature, and strikes a stunning blow. The great jaws are armed with

Courtesy of Doubleday, Page & Co.

AN ALLIGATOR TAKING A NAP

teeth for seizing and crushing the prey, but they are not fitted for chewing, since the food is swallowed whole. The full grown alligator can swallow a duck at one gulp. There is a valve in the alligator's throat that keeps out water when he is below the surface, no matter how widely he opens his jaws. Alligators can bellow as loudly as bulls.

HOUSE

The baby alligator should be kept in an aquarium one-half of which is built up into a solid landing place, so that the little reptile can be in the water and out, as it pleases; but a gradual slope is necessary so that it can lie partly in the water and partly out. The aquarium should be kept in a warm place and given all the sunshine possible.

FOOD

Mr. Deckert advises that baby alligators, until they reach about a foot in length, should be fed earthworms; after that, they will take any kind of fish cut in small strips, about three inches long and a half an inch wide. As the creatures grow larger they may be fed larger strips. It is better to offer the strips of fish with a pair of pincers or tongs, for the reptiles have sharp teeth and might possibly injure the hand that held the food. If crayfishes or minnows are placed in the tank the creatures will eat them. The food does not need to be given but once a week. The day after feeding the tank should be thoroughly cleaned, all the water siphoned out and plenty of fresh water put in and siphoned out again. The fresh water should be the same warm temperature as that siphoned out.

AFRICAN CHAMELEON

THE chameleon of Europe is an absurd little creature, looking more like a little tree-gnome than a living animal. Its head is crowned with a peaked hood, and its great globular eyes are covered with lids with peep-holes at the centers; the tail is quite as long as the body, a most convenient tail that can be twisted about twigs, and thus help the lizard in climbing about; the toes are also arranged for grasping twigs. The tongue of this chameleon shows a remarkable development; it is shaped like a cylinder enlarged at the tip, and can be thrust out several inches; it is covered with a viscid saliva, which glues fast to it any unfortunate insect which it touches. These little lizards are such active fly-catchers that from early times they have been kept about the houses of the peoples living on the Mediterranean coasts.

HOUSE

The house must be a box, covered with wire netting; it should have sand in the bottom, and there should be set within it a strong branching plant for the little creature to climb about upon.

FOOD

Chameleons are very fond of insects, especially of flies, and these should be let loose in the cage. They should be well fed, and with live insects. If flies and other insects fail, they may be fed meal worms with forceps.

CARE

The chameleon should always have plants or branches to perch upon. It is necessary to keep this almost tropical creature in a warm temperature, which should not fall below 60°.

Especially must we take great care in giving this chameleon a drink. It could never find a dish of water, therefore water must be sprayed into the cage with an atomizer, or a small spray pump, so that it may drink the spray as it falls. It should be sprayed at least once a day, at the same time care should be taken not to make the cage too damp.

THE AFRICAN CHAMELEON

Flycatcher here from Afric's shore,
You're a queer one I must say,
With scales and warts your'e covered o'er
In a very splendid way.

Your eyelid has a peep-hole in
Its very middle point.
You must be lazy not to wink!
Your tongue must have a joint!

The way you catch a buzzing fly
When you're so far from him,
Is 'most as queer as the way you twist
Your tail around a limb.

THE AMERICAN CHAMELEON

IN the Coast region of the Southern United States we too have a chameleon, which is often called the Green Lizard. But ours lacks the grotesque form of the European chameleon; its tail is about as long as the body, but is not used to twist about twigs. However, our chameleon lives also on trees and bushes, where it catches insects by stalking them, as a cat does its prey; and it also has the wonderful ability to change its hue. This change is not a matter of will, but is largely a result of temperatures, light and emotion. When sleeping, our chameleon is apple green; when angry or frightened, it is bright green; in the sunlight it is likely to be dark brown, and sometimes it is slate-colored, and sometimes yellowish. There is a theory that this change of color is for the purpose of rendering the creature inconspicuous against its background, and we have seen one of them lying partially upon a log, and partially upon a vine, and the part on the vine was green, and the part on the log was brown. However, the scientific authorities seem to think that this may be chance. It would be most interesting if those who keep such lizards as pets would make careful observations upon this particular point, especially when the chameleon is neither frightened nor excited.

The male chameleon has a peculiar pouch beneath its throat, which is a means of expressing his emotions. When trying to attract his mate he expands this pouch and nods his head vigorously as if saying, "Yes, yes, yes!" But when he sees a rival male he

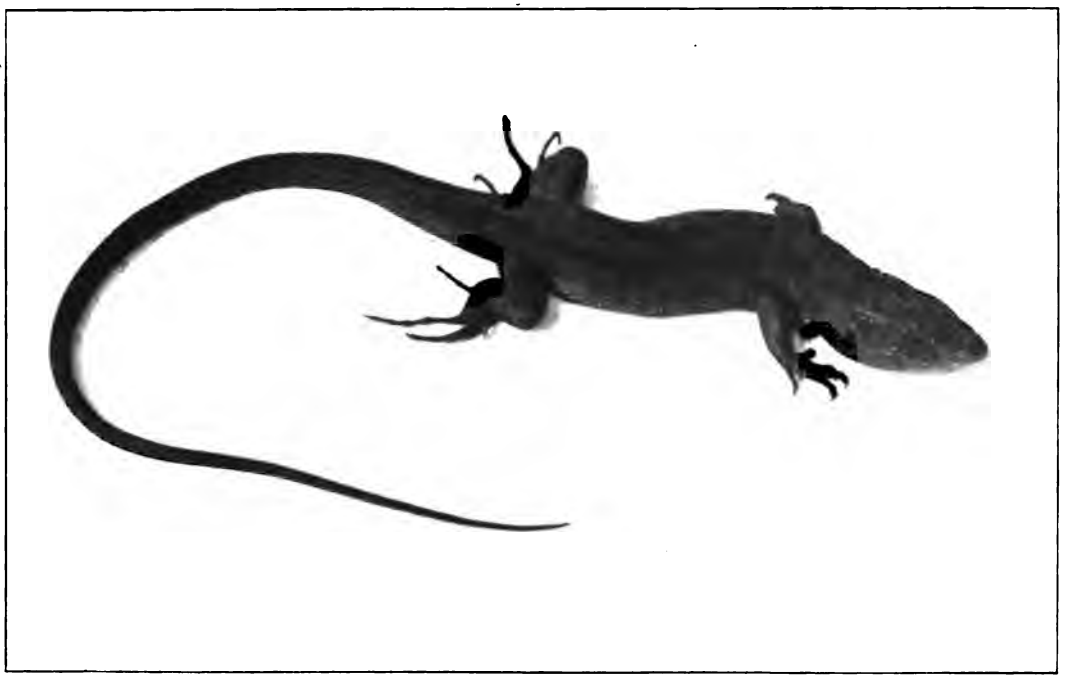

Photo by Edwin R. Sanborn

THE GREEN LIZARD, OR AMERICAN CHAMELEON

acts the same way, and the two fight viciously, each trying to bite off the other's tail; when the victor succeeds, he is so proud that he keeps on bowing while he still holds in his mouth the tail of the vanquished, which continues to wriggle wrathfully as if it were still animated by the spirit of its owner.

HOUSE

The American chameleon will thrive in a moss garden with ferns, since it lives naturally in damp places. It should also have a plant or branches upon which to crawl about.

FOOD

This chameleon likes flies best of all, but it will also take meal worms presented at first on the point of a wire; it will soon, however, learn to take food from the fingers. It likes grasshoppers, cockroaches and many insects, but will not eat earthworms.

CARE

These little pets are thirsty creatures, and require much water; but they are in the habit of drinking dew from the leaves, and they do not know how to get water from a dish. Thus the leaves of the plant on which they live must be thoroughly sprinkled at least once a day. They will soon die unless they are thus given water. Care should be taken in handling the lizards, for their tails break off easily; however, a chameleon thus abbreviated will grow another tail after a time.

REFERENCE

THE REPTILE BOOK, *Ditmars.*

THE HORNED LIZARD

Hornykins, Hornykins, open your eye,
For close to your nose is a blue-bottle fly!
Toadykins ruffle your spines and your frills
And scurry away on the rocks to the hills!

Little squat goblin, all bristling with spikes,
Flattened-out lizard that nobody likes,
Stone-colored hermit of sagebrush and sand,
You're the drollest hobgoblin of no-baby's land!"

*Charles A. Keeler.**

ALTHOUGH Hornykins looks like a toad made into a pincushion, it is not a toad at all, but a lizard despite its name. There are several species of these living in Southwestern United States, and in Mexico. These spiny little creatures are true denizens of the deserts, although some live also in pine and cedar belts.

The horned toad luxuriates in a heat that would be fatal to us, and, in fact, it is only active during the middle of the day, when the sun, shining through cloudless skies, brings the sand up to 60° centigrade. It then comes out and runs about as gay and happy as any little lizard can be; but before the sun sets, it again seeks its retreat, which it makes by ploughing a little furrow in the sand with its short nose. Into this furrow it settles, its body flattened out, and then, with the spiny edges along each side of its body, it

*From "Elfin Songs of Sunland," by permission of G. P. Putnam's Sons.

From Country Life in America

THE HORNED TOAD AT HOME

digs deeper until covered with sand, only the top of the head remaining in sight.

The horned lizard is protected by its spines, which should make a snake, or other fierce creature think twice before trying to swallow such a prickly morsel; and, too, it imitates the hue of the sand in its colors, so that it is practically invisible until it moves. It likes to clamber about on the cacti, agaves and yuccas, and seek protection among their thorns.

Hornykins feeds entirely upon insects. He does not dart about like the other lizards, but approaches his prey more deliberately; and, when near to it, out darts a sticky tongue, and the unfortunate insect disappears. However, it shows its lizard relationship by darting off with great rapidity when frightened. When caught, it flattens out, closes its eyes, and acts as if it were dead. When it is playing this little trick, if we tickle its sides gently, it will swell up to almost twice its natural size. Whether this is a sign of fear or of appreciation, we do not know. Sometimes, under great provocation, these lizards have been known to throw a jet of blood from the eyelids.

The young horned toads occur in litters of from six to a dozen, and each little fellow is encased in a transparent membrane, like a gelatine capsule. It usually breaks this membrane within an hour, and although it is not so spiny as its parents, it is active, and starts at once to earn its living by catching insects.

HOUSE

A cage of wire netting or glass, at least two feet square should be provided for the horned lizard. The bottom of the cage should be covered with three or four inches of clean building sand, which has been thoroughly dried in the oven. A cactus should be

planted in the cage, or a potted cactus may be set in the sand. The cage should stand where it will be kept very warm, and where the sun can shine directly on it at midday. In winter the cage may be placed on top of the radiator, for it is almost impossible in our cold northern climate to keep this little desert inhabitant sufficiently warm to save its life.

FOOD

Hornykins likes to catch his food for himself, therefore it is best to put into the cage, flies, roaches, small grasshoppers, and other small insects. If these cannot be caught, live meal worms do very well for steady diet. It is well to set a wire trap for flies, and then turn the contents loose in hornykins' cage. Feeding once a week is sufficient

CARE

If the horned toad seems inclined to hibernate, let him bury himself in the sand and do not disturb him, although the cage should be kept in a fairly warm room, it need not be kept on a radiator, nor in the sunshine. Hornykins must drink now and then, although it is a stupid little creature about finding a dish of water. Why should it not be, for in its native desert water does not occur in pools. Twice a week spray the cactus in the cage with pure water, either with an atomizer, or with the help of a whisk brush, taking great care not to wet the sand. This spraying should be done in the middle of the day, when the lizard is active; for when it sees the sun shining on the wet leaves, it will quench its thirst by drinking the drops.

REFERENCE

THE REPTILE BOOK, *Ditmars.*

Invertebrates

Although the little creatures without backbones are very different from those that have backbones, yet their ways are no less interesting. They can hardly be used as pets in the ordinary sense of the word, since they do not learn to recognize persons. However, there is no question but that honey-bees recognize individuals, and like some much better than they do others.

Although so different from us, and therefore more difficult for us to understand, yet many insects and their relatives are most interesting to us if we have them in cages where we can see their wonderful ways.

THE CRAYFISH

THIS little creature that haunts the still pools along the brook sides, or takes up its abode in shallow ponds, seems to have a great fascination for children, and many a poor crayfish has been brought in and placed in a pail of water, and given no care, and consequently soon died, while it would have been more interesting if it could have been introduced into an aquarium and there fed, and its interesting ways observed.

In their native brooks and haunts, crayfish hide beneath sticks and stones, or in caves of their own

making, the doors of which they guard with the big, threatening nippers, which stand ready to grapple with anybody that comes to inquire if there is anybody at home. The upper surface of the crayfish's body is always so nearly the color of the brook bottom, that the eye seldom detects the creature until it moves; and if some enemy surprises one, it swims off tail first with terrific jerks which roil all the water around and thus cover its retreat. In the winter, our brook forms hibernate in the muddy bottoms of their summer haunts. There are many species; some in our Southern States, when the dry season comes on, live in little wells which they dig deep enough to reach water. They heap up the soil which they excavate around the mouth of the well, making well-curbs of mud; these are ordinarily called "crawfish chimnies." The crayfishes find their food in the flotsam and jetsam of the pool. They seem fond of the flesh of dead fishes and are often trapped by its use as bait.

Looking at the crayfish from below, we see on the abdomen some very beautiful featherlike organs called swimmerets. Each swimmeret consists of a basal segment with twin paddles joined to its tip, each paddle being narrow and long and fringed with hairs. The mother crayfish has four pairs of these, one pair on each of the second, third, fourth and fifth segments; her mate has an additional larger pair on the first segment. These swimmerets, when at rest, lie close to the abdomen and are directed forward and slightly inward. When in motion they paddle with a backward, rythmic motion, the first pair setting the stroke and the other pairs following in succession. This motion sends the body forward, and the swimmerets are chiefly used to aid the legs in forward

locomotion. A crayfish, on the bottom of a pond, seems to glide about with great ease; but place it on land, and it is an awkward walker. The reason for this difference lies, I believe, in the aid given by the swimmerets when the creature is in water.

The mother crayfish has another use for her swimmerets; in the spring, when she is ready to lay eggs, she cleans off her swimmerets with her hind legs, covers them with waterproof glue, and then plasters her eggs on them in grapelike clusters of little dark globules. What a nice way to look after her family! The little ones hatch, but remain clinging thus to their mother until they are large enough to scuttle around on the brook bottom and look out for themselves.

Not only is the crayfish armed in the beginning with a number of legs, antennæ, etc., but if it happens to lose any of these organs, they will grow again. It is said that, when attacked, it can voluntarily throw off one or more of its legs. We have often found one of these creatures with one of the front claws much larger than the other; it has probably lost its big claw in a fight, and the new growth was not yet completed.

I have been greatly entertained by watching a female crayfish make her nest in my aquarium which has, for her comfort, a bottom of three inches of clean gravel. She always commences at one side by thrusting down her antennæ and nippers between the glass and stones; she seizes a pebble in each claw and pulls it up and in this way starts her excavation; but when she gets ready to carry off her load, she comes to the task with her tail tucked under her body, as a lady tucks up her skirts when she has something to do that requires freedom of movement. Then with

her great nippers and the two pairs of walking feet, also armed with nippers, she loads up as much as she can carry between her great claws and her breast. She keeps her load from overflowing by holding it down with her first pair of jaw-feet, just as I have seen a schoolboy use his chin, when carrying a too large load of books in his arms; and she keeps the load from falling out by supporting it from beneath with her first pair of walking legs. Thus, she starts off with her "apron" full, walking on three pairs of feet, until she gets to the dumping place; then she suddenly lets go and at the same time her tail straightens out with a gesture which says plainly, "There!" Sometimes when she gets a very large load, she uses her second pair of walking legs to hold up the burden, and crawls off successfully, if not with ease, on two pairs of legs,—a most unnatural quadruped.

HOUSE

The aquarium in which the crayfish is kept should have at least three inches of gravel at the bottom, and there should be in it an abundance of pond weed. However, the water should not be more than three or four inches deep above the gravel, and at one side the gravel should be slanted up until it is within an inch or so of the surface of the water. Not more than two or three crayfish should be kept in an ordinary aquarium.

FOOD

Bits of meat, liver, or fish attached to a string, so that they may be removed before too stale, should be placed in the aquarium two or three times a week. Professor George Embody has trained his crayfish to eat various kinds of fish food made from meat scrap.

CARE

The great point in keeping crayfish alive in an aquarium is to give them a chance to breathe. Having plant life in the water will help, but even with this the aquarium must be arranged so that the crayfish may reach the surface of the water, and thus supplement the oxygen which it gets from the water.

THE CRAYFISH

Oh, Mr. Crayfish, you are, you know,
The color of the brook,
And I can never see you go,
Unless I "speshul" look.

You have so many legs
And fringing swimmerets,
That I should think you'd never know
Which pair forward sets.

Your big front fists in padded gloves
Give you a boxer's fame,
But you do not strike, you always pinch;
Like a girl you play the game.

THE LUBBOCK ANT NEST

ERY interesting stories may be read in the observation cage. To make this ant nest we must have two pieces of window-glass, ten inches square; a sheet of tin, eleven inches square; a piece of plank, one and one-fourth inches thick, twenty inches long and at least sixteen inches wide; a sheet of tin, or two thin, flat boards, five by ten inches in size.

Take the plank and on the upper side, a short distance from the edge, cut a deep furrow. This furrow is to be filled with water, as a moat, to keep the ants imprisoned. It is necessary, therefore, that the plank should have no knot holes, and that it be painted thoroughly to keep it from checking. Take the sheet of tin eleven inches square, and make it into a tray by turning up the edges three-eighths of an inch. Place this tray in the middle of the plank. Place within the tray one pane of glass. Lay around the edges of this glass four strips of wood about half an inch wide and a little thicker than the height of the ants which are to live in the nest; burnt matches serve very well for this. Cover the glass with a thin layer of fine earth. Take the remaining pane of glass and cut a triangular piece off of one corner, then place the pane on top of the other, resting upon the pieces of wood around the sides. The cover of the nest may be two pieces of tin, with handles soldered at the centers, or two boards with screw-eyes or knobs at the centers, with which to lift them. There

Photo by Harry H. Knight

A LUBBOCK ANT'S NEST WITH ONE-HALF THE COVER LIFTED

Photo by H. D. Bailey

PRETTY CATERPILLAR

should be a piece of blotter or of very thin sponge, introduced into the nest between the two panes of glass, in a position where it may be reached with a pipette, without removing the upper glass, for it must be kept always damp.

To establish a colony of ants in this nest we should proceed as follows: Take a two quart glass fruit jar and a garden trowel. Armed with these we visit some pasture or meadow near by, and find under some stone, a colony of ants which have plenty of eggs and larvæ. We scoop up carefully eggs, ants. dirt and all and place them in the jar, being as careful as possible not to injure the little creatures. While digging, we must search carefully for the queen, which is a larger ant and is sometimes thus found. But if we have plenty of eggs, larvæ and pupæ, the ants will become very contented in their new nest while taking care of them. After we have taken all the ants desirable, we place the cover on the jar, and thus carry them to the Lubbock nest and carefully empty the contents of the jar on top of the cover of the nest. Of course the furrow around the plank has been filled with water, so the stragglers cannot escape. The ants will soon find the way into the nest through the cut corner of the upper pane of glass, and will transfer their larvæ to it because it is dark there. After they are in the nest, which should be within two or three hours, we remove the dirt on the covers, and the nest is ready for observation. But, since light disturbs the little prisoners, only one cover should be removed at a time and then for short periods.

The Fielde nest is better adapted for a serious study of ants, but it is not so well adapted as the Lubbock nest for popular use, especially for the use of children.

After the nest is made, and the ants are well-established, we must be very careful to provide them with fresh food every day. The following things may be given: Bits of hard-boiled yolk of egg, any dead insects or spiders that can be found, bits of meat, raw or cooked, and bread, seeds of both plants and grasses, berries and fruits of all kinds that have been broken or injured.

WHAT MAY BE SEEN WITHIN THE ANT NEST

After the ants' nest has been made and a colony of ants established within it, we may give closer attention to these little citizens, since now they are dependent on our care. The ant is an especially good runner. I once timed an ant that was going at a moderate rate of speed, and yet she was making sixteen yards per second, if calculated on a human basis, comparing the size of the ant with the size of a man. The ants' eyes are rather dull, but she has a good brain behind them; in fact, she does not need to see very much, since so much of her life is passed in darkness. But we must study her jaws with especial interest because they are her chief utensils and weapons. With them she carries home her heavy burden of food; with them she gently lifts the youngsters in her charge; with them she crushes and breaks up food, and also carries out soil from her tunnel; and they are also her weapons in battle. Of equal importance with the jaws are the antennæ, which are always moving to receive new sensations. They are far more delicate than the fingers of the blind when used as organs of touch, and they are also possessed of other sense organs, which may be compared with our organs of smell. It is quite natural that the ant,

depending so much on her antennæ for impressions, should be very particular to keep them clean. She has a little natural brush on her wrist, which she uses to clean them with, and we may watch this process any day. She lifts her leg over one antenna, brushes it downward, then licks the brush clean, as a cat washes its face. As she runs about in the nest she keeps her antennæ always moving, to discover the nature of her path. If she meets a sister ant their antennæ cross and pat each other, and occasionally we see them thus holding quite lengthy conversations. The ant is a good sister, and is always willing to feed another member of her colony if there is need; she will also help a sister at her toilet, and lick her with her tongue, as one cow licks another. Sometimes we will see an ant spend a half hour or more making her own toilet.

But of all the interesting things to watch in an ant's nest is the care given to the young. The queen ant, which is a mother of the colony, lays tiny eggs, not larger than pin points, and these eggs have sticky shells so that they cling together in bundles, and are thus carried by the nurses. Also the tiny larvæ, when they first hatch thus cling together. The larvæ are odd looking little creatures, shaped like crooked-necked gourds, the small end being the head and neck. The ant nurses classify the youngsters in groups of about the same size and age, so when we look into an ant hill we find that the larvæ of different ages are placed in different chambers, like a graded school. When the larvæ are young, the nurse ant feeds them on food which she has partially digested; but as they grow older the food is brought to them, or they are carried to the food, and they do their own eating. In one of my nests I placed a bit of hard-

boiled yolk of egg, and the ant nurses brought the larvæ to this and dumped them down around the edges of it; there they nibbled industriously until I could see the yellow of the egg extending down the centers of their little transparent bodies.

We should note how carefully an ant nurse lifts the babies in her jaws. Later, when the larvæ change to pupæ, and are hard-shelled, and are about the size of a grain of wheat, the ant nurses take hold of the loose outside skin, as we might carry a baby by its clothes. The ant nurses spend much time in licking the larvæ and pupæ, thus keeping them very clean; and when the young ant comes forth from the pupa skin, quite pale, and with cramped legs and antennæ, the nurse will take hold and straighten out the legs, and pat the youngster, and lift it carrying it about if necessary, and feed it from her own mouth, in fact, doing everything that a tender mother nurse should do.

One of the things we must particularly notice is the way the ants keep their nests clean. They pile all of their refuse in one corner, and as far as possible from the brood. We often see ants asleep. They seem as motionless as if they were dead, but when they awake they are lively enough. If we are lucky enough to find a queen in the nest, we may be able to observe the tender care given her by her ladies in waiting, who feed her, and lick her clean, and show much interest in her welfare.

In observing the ants we should remember that it disturbs them very much to have the light let in upon them, therefore we should remove one cover only, and for a short time. If we simply leave one-half the nest exposed, then we may see the ants lift the larvæ and pupæ and carry them safely to the dark side.

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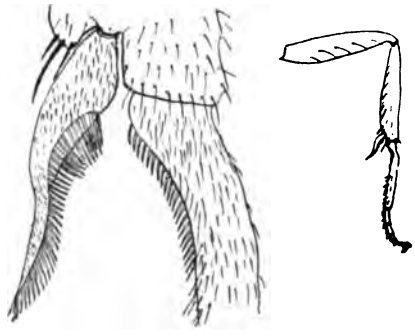

Front leg of an ant and the antenna-comb on the front leg, greatly enlarged

THE OBSERVATION BEE HIVE

HE observation hive is very simply constructed and can be made by anyone who knows how to use ordinary carpenter tools. It is simply a small, ordinary hive with a pane of glass on each side which is covered by a hinged door. A hive thus made is placed so that the front end rests upon a window sill; the sash is lifted an inch or so, a strip of wood, or a piece of wire netting being inserted underneath the sash except in front of the entrance of the hive, to hinder the bees from coming back into the room. A covered passageway should extend from the entrance of the hive to the outside of the window sill. This window should be one which opens away from the most frequented side of the house so that the bees coming and going, will not come into collision with people. The door covering the window in the hive should be kept carefully shut, except when observations are being made, since the bees object to light in their home.

The A. I. Root Co. of Medina, Ohio, sell a pretty observation hive which we have used successfully by stocking it afresh each season, it being too small for a self-sustaining colony. But it has the advantage of smallness which enables us to see all that is going on within it, which would be impossible in a larger hive. This hive comes in several sizes, and will be shipped from the makers stocked with bees at prices ranging from $1.25 to $4.00.

WHAT MAY BE SEEN IN THE OBSERVATION HIVE

It is very interesting to watch the bees build their comb. When more comb is needed certain members of the colony gorge themselves with honey and remain suspended while it oozes out of the wax pockets on the lower side of the abdomen. This wax is collected and chewed to make it less brittle and then is carried to the place where the comb is being built and is molded into shape by the jaws of the workers. However, the bee that puts the wax in place is not always the one that molds it into comb.

A bee comes into the live with her honey stomach filled with nectar and disgorges this into a cell. When a bee comes in loaded with pollen, she first brushes it from the pollen baskets on her hind legs into the cell; later another worker comes along and packs the pollen grains into the cell with her head, which is a comical sight.

The bee nurses run about on the comb feeding the young bee grubs partially digested honey and pollen regurgitated from their own stomachs. Whenever the queen moves about on the comb she is followed by a retinue of devoted attendants which feed her on the rich and perfectly digested royal jelly and also take care of her royal person and give her every attention possible. The queen, when laying, thrusts her abdomen into the cell and glues a little white egg to the bottom. The specially interesting thing about this is that the queen always lays an egg that will produce a female, or worker in the smaller cells and will always lay an egg to produce a drone or male in the larger cells.

If there is any foreign substance in the observation hive it is interesting to see the bees go to work at

once to remove it. They dump all of the debris out in front of the hive. They close all crevices in the hive; and they will always curtain the glass, if the door is kept open too much, with propolis or bee glue, which is a very sticky substance they collect from leaf buds and other vegetable sources. When bees fan to set up a current of air in the hive, they glide back and forth, moving the wings so rapidly that we can only see a blur about their bodies.

If drones are developed in the hive, it is interesting to see how tenderly they are fed by their sister workers, although they do not hesitate to help themselves to the honey stored in the cells; and if the observation hive is working during September, undoubtedly we may be able to see the murder of the drones by their sisters. But we should understand that this killing of the drones is necessary for the preservation of the colony, as the workers cannot store enough honey to keep the colony alive during the winter if the drones were allowed to go on feeding.

If we see the worker bees fighting, it means that robbers are attempting to get at the stores of the observation hive. The entrance to the hive should at once be contracted by placing a block of wood in front, so that there is room for only one bee at a time to pass in and out.

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From Country Life in America

AN OBSERVATION BEE-HIVE

Note the covered passageway from the hive out under the window sash

MANY INTERESTING HAPPENINGS IN THE SCHOOL TERRARIUM

THE TERRARIUM

MANY little creatures brought in from the fields may find a happy home in the terrarium which is a box, with its sides of glass or netting, that is fitted in various ways to be the home of its many inmates.

Miss Alice I. Kent has given a most charming description of life in a terrarium, which was published in Nature-Study Quarterly No. 8, of the Cornell University Teachers' Leaflets, and permission has been obtained to republish it in this book of pets for the benefit of many children.

"Here is a fragment of the drama, as written in one terrarium.

This terrarium was made from an old berry crate. When the children saw it first, last fall, this is what it looked like: a large rectangular box, grass-green in color, thirty-nine inches long, eighteen inches wide and fifteen inches high. The long sides were of glass, the short sides and top of green-wire netting. The top could be removed like the lid of a box. It stood upon a pedestal-table provided with castors. In the bottom of the terrarium were three inches of rich soil, covered with the delicate green of sprouting grass seed. In one corner was a mossy nook, and in another a mass of thistles and clover. At one end, a small cabbage was planted and at the other lay several sprays of glossy pin-oak. Suspended from the top, was a large spray of purple thistles.

Among the thistles in the corner, ten pendents of vivid green, bright with golden points, could be seen. They were the chrysalids of the Monarch, or milkweed, butterfly. Among the cabbage leaves, were many of the yellow green eggs and several of the caterpillars of the cabbage butterfly. Among the sprays of oak in the corner, several oak caterpillars were feeding.

Before many days had passed, the drama of life began. One by one, the chrysalids of the milkweed butterfly paled in color and, becoming transparent, showed through their whitened walls the orange-colored wings of the developing butterflies within. They then burst, freeing their gorgeous tenants. This happened until there were seven butterflies in the terrarium. As two of these proved discontented with their new home, they were set free. The five others spent the little round of their aerial life seemingly happy and satisfied. They lived from three to six weeks and showed some individuality in their tastes and habits. Sometimes they chose the mossy corner for their resting place. On other occasions they preferred the netting at the ends and top of the terrarium. In fact, the netting at the ends of the terrarium was a source of pleasure to these butterflies, as it served as a secure resting place and an agreeable and convenient pathway to the top. One of them spent nearly all its life on the thistles suspended from the top. These thistles were kept fresh for a long time by placing their stems in a large sponge which was frequently drenched with water.

The butterflies showed some individuality in their eating also. Thistle, clover, goldenrod, nasturtiums, and honey-suckle were offered to them. The thistle and goldenrod were most frequently visited, and next

to these the nasturtiums were most favored. Another fact noted was that most of the butterflies continued to visit the flower first chosen. When however, a thick syrup of sugar and water was offered to them, the flowers were much neglected, only one butterfly persisted in flower-visiting. Goldenrod was its choice. If the syrup was fresh made every morning, and was placed in a convenient spot, the butterflies never failed to sip it. They generally slept clinging to the wire netting at the ends or top of the terrarium.

In the meantime the cabbage began to attract the watchful eyes of the wondering children. As it had industriously sent out many tiny roots, it proved a safe and satisfactory home for its hidden occupants. Soon, one by one, the caterpillars began to appear at the edges of the uppermost leaves. They began small tours in the vicinage of the cabbage, and, finally, as with the butterflies, the end wire nettings proved to be an easy pathway to the top of the terrarium. Here several found good resting places, and slowly changed to chrysalids.

One day a cabbage butterfly flew in at the open window. It was caught and placed in the terrarium. It, too, proved to be very fond of sugar syrup. One morning the syrup was accidentally spilled on the wooden ridge at the bottom of the terrarium outside of the netting. The butterfly was so hungry that it could not wait for food more conveniently placed; so it stretched its tongue out, full length, through the netting, and in that way obtained it. The children were surprised to find its tongue somewhat longer than its body.

At this time, the cabbage was removed so that the eggs and the remaining young caterpillars could be observed. The protecting coloring of the eggs and

caterpillars was first noticed. One little boy at first announced that the 'caterpillars were green because they were not ripe,' a good example surely of the danger of reasoning from analogy.

Very soon the inhabitants of this terrarium world began to increase. A father and two mother grasshoppers and a young one, with his "armor on," came to live there; also a "woolly bear," several other species of caterpillars, several species of beetles, a big horse-fly, some lady-bugs, and a cicada. About this time too, some very unwelcome immigrants appeared. These were the ichneumon flies. So numerous did they become in a very short time that they threatened desolation to this prosperous community. Nature's methods were then scrutinized and the services of two tree-toads were sought. Their response was immediate and cordial. Soon not an ichneumon fly could be found.

The grasshoppers were partial to celery, over-ripe bananas, and moisture. Three days after they became inhabitants of this miniature world, the mother grasshopper dug a hole in the ground and laid eggs. The observing children then had before them living illustrations of the three stages of grasshopper life.

The tree-toads were both amusing and accommodating. They, too, liked the wire netting at the ends of the terrarium, and delighted the children by climbing up foot over foot, or hand over hand, like odd four-handed sailor boys. This brought into plain view the tiny suckers on their feet.

After the ichneumon flies had disappeared, a new difficulty arose. The ground became mouldy, and the grass died down. The terrarium was then placed by an open window and left there several hours for a

number of days, until it was thoroughly dried out. Then bird-seed was planted and the ground was watered thereafter with a small plant syringe. This gave sufficient, but not excessive moisture, and it was one of the pleasures of the children to imitate a rainy day in the terrarium world. And it was a pleasing experience, for there were splashes of water on the glass sides and many shining drops on the netting and verdure, which soon grew several inches tall; there was the same delightful odor of rich, fresh earth that one enjoys during summer rains, and the sunshine touched with brilliancy the gay fall flowers and the gorgeous outspread wings of the butterflies.

It was now early in November and each day found one or more of the terrarium inhabitants missing. One of the caterpillars disappeared and a cocoon made of its own hair was found in its place; several chrysalids were found on the top of the terrarium; the butterflies and the grasshoppers, one by one, went into that sleep from which there is no awakening; and a number of other creatures disappeared. The children finally concluded that the latter had gone to sleep in the ground. The grasshoppers and the tree-toads were the last to take their rest, but just before they answered Mother Nature's call to slumber, a large garden toad came to bear them company.

He was a very interesting toad for he bore signs of having lived through what must have been almost a tragedy. He had lost the lower half of one front leg and had the scar of a long gash on his throat. These disfigurements seemed not to cause him the least unhappiness, for he had a very bright wide-awake expression and was as plump and complacent as a toad should be. The loss of his leg caused him a little inconvenience, for he sometimes lost his

balance when hopping and fell on his back. He occasionally found it difficult to right himself at once, but a few vigorous kicks and jumps generally placed him right side up. Three days after he became a member of the terrarium community, he, too, heard Mother Nature's call to bed, and partially buried himself. Each day he covered himself more completely, until finally only the top of his head and two sleepy eyes were to be seen. One day, about a week afterward, he disappeared entirely. He proved to be a very restless sleeper, and frequently showed himself during the sunniest parts of nearly every day all winter, occasionally coming entirely out of his earthy covering. He served as a sort of barometer all winter, appearing in bright and disappearing in gloomy weather. He never, however, left the spot he had chosen for his bed.

"Winter is the night of the year," and the little terrarium world indoors exemplifies it as truly as the great fields of Nature's domain out of doors. The soil is dry and hard in this miniature world and the verdure has dried down to palest green and brown. In its earthy bed, the caterpillars, beetles and other creatures lie cosily asleep, and with the masses of tiny eggs, await the vivifying touch of spring.

MEAL WORMS AS FOOD FOR PETS

MEAL worms are the young or larval stages of a beetle (*Tenebrio molitor*), that luckily for pets but unluckily for grain dealers, breeds constantly and most prolifically. These insects are eminently fitted to be made into beefsteak for birds, toads, fish, and many other pets. To breed meal worms it is necessary to buy a hundred or so of a regular dealer in bird food. These should be placed in a two-gallon jar, or a tight box, containing a mixture of bran, corn-meal, oat-meal, and graham flour, or almost any uncooked breakfast food; bran alone will do, but a more varied diet seems to make for more rapid growth. There should be four or five inches of this mixture in the bottom of the jar, and upon it should be scattered a few shavings or bits of shingle for the insects to hide under. After the meal worms have been introduced to their new home, cover the jar with a piece of very fine wire gauze. This will admit the air, and if cloth is used instead of the wire gauze, the beetles will eat their way through it and escape. Place the jar in a dark, warm situation, for warmth is very necessary to the rapid multiplication of these insects. If these directions are followed, in the course of a few weeks there will be produced an ample stock of food for a reasonable number of pets.

More of the food mixture must be added as the worms develop and devour it.

To capture the meal worms take out a handful of the mixture, spread it out upon a paper, and pick up the insects with forceps.

Courtesy Doubleday, Page & Co.

FULL MEASURE

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